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3dcreative

Issue 086 October 2012

Gregory Callahan
3D Concept Artist

The Last Stand
Project Overview
by Francesc Camós

Gallery
Gallery - 10 of the best images from around the world!

Cover image by Daniel Bystedt

NEW!

Daniel Bystedt is the first to tackle these four-legged critters, as he kicks off this new series by creating this desert creature entirely in ZBrush.

ZBRUSH QUADRAPEDS

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NEW! Futuristic Vehicles
Arturo Garcia (3dsmax) and **Renato Gonzalez Aguilante** (Maya) combine to kick off our new series, showing us how to create futuristic vehicles.



Texturing and Lighting in Photoshop
Aleksander Jovanovic teaches us some valuable techniques whilst showing us how he added color to his textureless render using just Photoshop.



Unreal Games Engine Environment
Andrew Finch continues to build his game level and in this chapter finalizes the environment.



Editorial

Welcome to the October issue of *3DCreative*! I hope you are ready to be inspired this month, as we are fit to burst with brand new tutorial series for you to get stuck into!

Let's get started with this issue's stunning cover by Daniel Bystedt, which is the first installment to brand new tutorial series: ZBrush Quadrapeds. ZBrush is an impressive piece of software that can accomplish so much. With endless possibilities, your imagination is the limit. In this series our brilliant artists have been given complete creative freedom to show us how to create the organic forms of their quadrapeds, and Daniel is the first to get the ball rolling!

Talking of new tutorial series, the second one starting this month is based on the awesome 2D concept created by talented 2D artist Ling Yun. Futuristic vehicles are a popular subject matter amongst CG artists and a high proportion of the potential jobs that you can do in 3D require you to be able to create an accurate model using a 2D concept. In this series our two artists will be using the 2D concept and technical drawings provided, to talk us through a step-by-step guide to turning this information into an accurate and exciting 3D model. Arturo Garcia starts us off in 3ds Max, while Renato Gonzalez Aguilante uses Maya.

Andrew Finch continues to guide us through the Unreal Games Engine tutorial series, using programs such as 3ds Max, Photoshop and UDK to create a playable game level. Last time we saw Andrew begin finalizing the environment by placing temporary materials on the walls and floors. In this chapter he continues to finalize the environment, this time demonstrating how to place the final materials and correctly UV map them to the surface.

Unfortunately due to unforeseen artist circumstances, we are unable to bring you the last installment in the Building Droids series. However we have provided Ignacio Bazan Lazcano's 2D concept and technical drawings, so you can still have a go at recreating this awesome bar tender droid with the techniques you have learnt in previous chapters of the series.

As a one-off this month we bring you Texturing and Lighting in Photoshop by the brilliant Aleksander Jovanovic. In this detailed tutorial Aleksander demonstrates how he used Photoshop to apply color to his un-textured render, in this diverse scene full of different colored items made from different materials to demonstrate the power and flexibility of Photoshop. Not only does he use Photoshop to resolve the textures, but he also shows how to add lighting to complete the dramatic and creepy scene. If you enjoy this tutorial, be sure to check out *Photoshop for 3D Artists* in the 3DTotal shop for more tutorials like this one.

If all that wasn't exciting enough, we also have an interview with talented concept artist Gregory Callahan, a thought-provoking Making Of by Francesc Camós, and our usual stunning gallery featuring work by Bruno Melo, Jorge Lopes, Mauricio Alves Salgueiro and many more!

Contents

What's in this month?



Gregory Callahan
Interview - 3D Concept Artist



The Gallery
10 of the Best 3D Artworks



Futuristic Vehicles
3ds Max & Maya - Chapter 1



Texturing and Lighting
Photoshop for 3D Artists sample chapter



The Submarine Box
Chapter 4: Finalizing the Environment



ZBrush Quadrapeds
Chapter 1: Desert Creature



"The Last Stand"
Project Overview by Francesc Camós



Free Chapter
Digital Art Masters: Volume 6 - Dennis Allain



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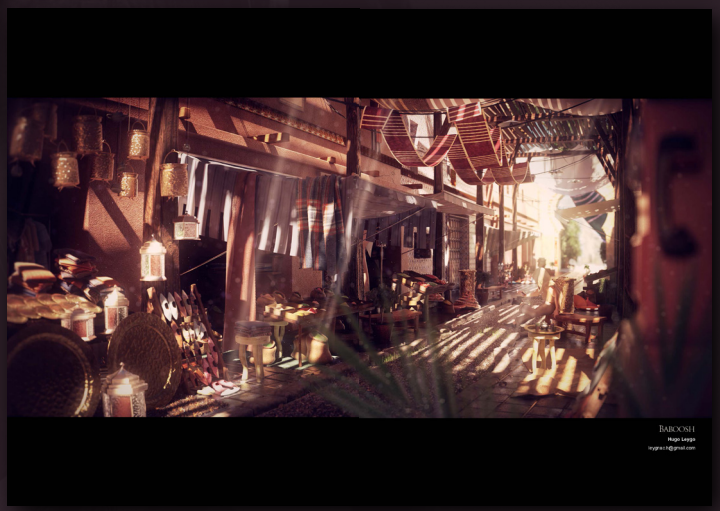




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If you're having problems viewing the double-page spreads that we feature in this magazine, follow this handy little guide on how to set up your PDF reader!







Setting up your PDF reader

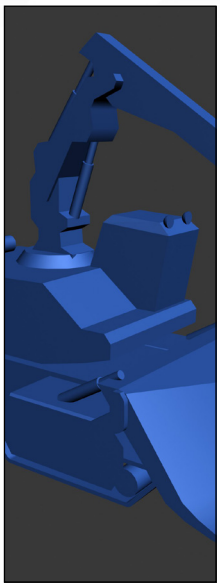
For optimum viewing of the magazine, it is recommended that you have the latest Acrobat Reader installed. You can download it for free, here: DOWNLOAD!

To view the many double-page spreads featured in 3DCreative magazine, you can set the reader to display 'two-up', which will show double-page spreads as one large landscape image:

1. Open the magazine in Reader;
2. Go to the View menu, then Page Display;
3. Select Two-up Continuous, making sure that Show Cover Page is also selected.
That's it!

Contributing Artists

Every month artists from around the world contribute to 3DCreative, and you can find out a little more about them right here! If you'd like to get involved in the 3DCreative magazine, please contact: simon@3dtotal.com



Arturo Garcia



Arturo Garcia is a freelancer living in Mexico, with 2 years experience in modelling cars. He uses 3ds Max software, and his goal is to make models become as real as possible – even confusing them with what *is* real!

http://dessga.cgsociety.org/gallery

dessga@yahoo.com.mx



Andrew Finch

Aged 30 and living in the great city of Birmingham, in the U.K. He has a degree in 3D Animation which inspired his passion for environment art. He now works as an environment artist at Codemasters. He says, "Working in the games industry is exciting: you never know what the next project will be and there's always something new to learn. This helps to keep you creative and grow as an artist." afinchy@googlemail.com





Francesc Camós



Francesc Camós has a PhD in Philosophy and for six years researched the philosophy of language, until five years ago when his interests turned to CG imagery. Since 2010 he has been working at Kandor Graphics as a texture artist for a 3D animated movie.

fcamos@gmail.com



Image by Hugo Leygo


Image Courtesy of Ali Zafati
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"I Quickly learned 3D animation was nothing like doing it traditionally and found I enjoyed modeling characters in 3D more than animating them."



INTERVIEW WITH

GREGORY CALLAHAN

This month's interview is with talented concept artist Gregory Callahan. He talks to us about the attention to detail in his work process and approach to capturing personality, as well as software development within the industry.

Can you tell us a little about your background and how you came to be where you are now?

Like most artists, I've been doing art all my life. I always dreamed of animating for Disney as a kid. As I got older, I started looking for a path to turn my passion for art into a viable career. With traditional animation being overtaken by 3D animation in the early 90s, I pursued that venue. However, I quickly learned 3D animation was nothing like doing it traditionally and found I enjoyed modeling characters in 3D more than animating them.

After a few years of attending the Art Institute of Dallas and putting together a demo reel, I set my sights on getting into the booming games industry. I landed a job as a video game character artist working on *Deus Ex* and have been working primarily in the games industry ever since. In more recent years I've been pursuing my desire to digitally sculpt toys and collectibles.

"THERE REALLY IS NO REPLACEMENT FOR REAL WORLD TRAINING ON THE JOB."

How was it working on *Deus Ex* as a first title and what lessons did you learn from your initiation into the games industry?





Humbling... I graduated with the best portfolio in my class. It was an achievement I was pretty proud of at the time and worked very hard for.

The first day on the job you realize that it really doesn't mean much (other than it got your foot in the door). There really is no replacement for real world training on the job. When I look back now I think of how fortunate I was to work with such a supportive art team at Ion Storm. The group of artists I worked with on *Deus Ex* really showed me the ropes. It's something I reflect on now when a young artist starts at a studio I'm working at.


GREGORY
CALLAHAN '09



When starting a new character what is your general approach and process?

For my personal work, I strive to really capture the person's character. I want the viewer to really get a sense of who the person is through the attitude they convey in their facial expression and body language. For this reason, I spend a lot of time early in the creation process nailing down the base gesture. This is all done very loosely in 3D – almost like a sketch – which allows me to iterate quickly.

The other thing I spend a fair amount of time on when starting a character is gathering photo references. I like to have every detail planned out before I get too far into a project, almost like a blueprint.

How do you find the task of capturing a character's personality in 3D compared to portraying it in 2D? Do you find the challenge equally balanced?

Balanced, but in different ways. The obvious being that when doing a 2D portrait you are creating the lighting, whereas on a 3D character the lighting is kind of a freebie.

However, in 3D you have to deal with making the character look good from all angles. For that reason, I wouldn't say 3D is more challenging, but definitely more time-consuming. I can't tell you how many times I've worked on a character and gotten fixated on an angle before rotating it and realizing it looks horrible. At that point, I tend to envy 2D artists.

ZBrush has brought about a revolution in character modeling, but what other areas of 3D do you feel need improving?

Without a doubt, hair needs major workflow improvements. I often refer to hair as the holy grail of 3D. Yes, it can be done well (as seen in various 3D feature films), but whole teams of artists and programmers went into making, styling and animating it. Also, enormous processing power is needed to render it.

The tools for modeling/styling hair in 3D applications have improved over the years, but the process still relies more on technical knowhow than artistic ability. Real-time hair in video games is equally frustrating to make and has probably benefited from less advancements (both tool-wise and rendering) over the years, which explains why most male game heroes only come in two flavors: bald or spiky haired.

Do you think software development has changed artistic approach to character design?

Very much so; software is becoming increasingly more "artist friendly". I've seen guys who know nothing about 3D pick up packages like ZBrush and do amazing things because they were amazing artists and not because they have mastered a program.


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XXX
GREGORY CALLAHAN '08

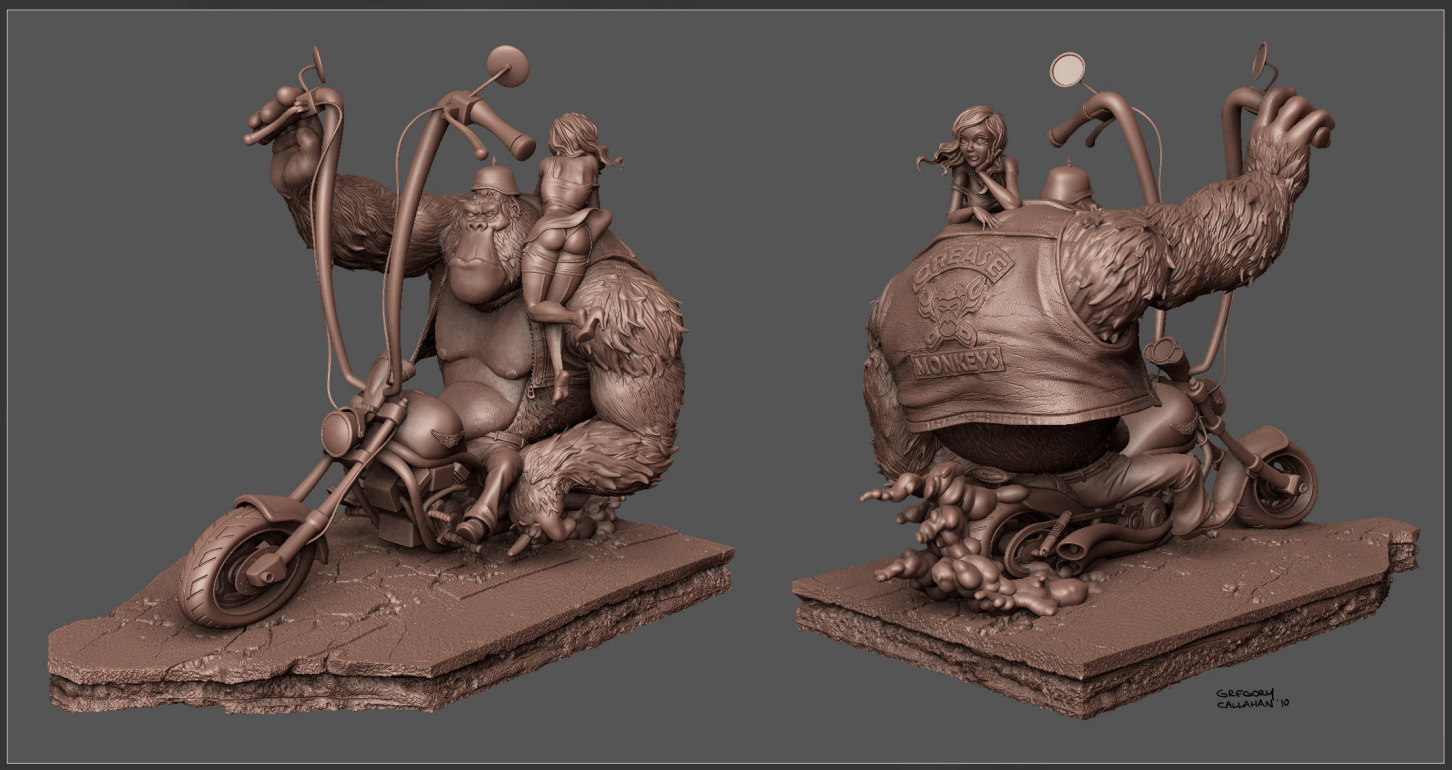


In the past it felt like you had to be very computer savvy to make anything decent, but ZBrush tools such as DynaMesh and ZSphere have completely changed the design process just in the past few years. Gone are the days of endless pushing and pulling vertices. Now I can block out mechs and creatures quickly and explore different shapes in a simple fashion as a concept artist would, but only better because it's in 3D!

Have you noticed this advance having any impact on character concept artists within the games industry and do you feel that one day 3D may substitute much of what has traditionally been reserved for 2D within this genre?

I think 3D is just another tool for concept artists. Some embrace it and some are overwhelmed by its complexity. You see 3D used more in environmental concept art in the games industry. Concept artists often use it as an aid for figuring out complicated perspectives or to explore different camera angles quickly.

As for characters, I think the movie industry has adopted it more widely. It seems like I see digital sculpting more and more for digital maquettes. I don't think 3D will ever replace 2D concept art; it's just faster.




LEX TEL
SUPERMAN
GREGORY CALLAHAN

What changes do you anticipate in the next gen games with regards to character development?

Richard, if you don't mind I'd like to pass on this question, since I have access to next gen tech. I don't want to leak anything!

Okay fair enough… so how has it been developing characters for Sideshow Toys and are there many constraints with respect to the topology?

The thing I love about making characters for collectables/toys is you are not limited by topology. In my day job I am constantly tweaking edge flows and ensuring joints have an adequate number of loops for animation. That's not to say you can just be sloppy with topology when sculpting a digital statue, because it's still very important to have clean topology and more specifically, have an evenly distributed topology.

By having it evenly distributed, it ensures that you can sculpt at the same level of detail throughout the character. There's nothing worse than having to subdivide your whole mesh, just to get the detail you need in an area with a stretched polygon. In an ideal world, I'd be working in a 3D package similar to ZBrush but voxel-based, so that I wouldn't have to think about topology whatsoever.

"WHEN HUMANS ARE BADLY REPRESENTED, IT DOESN'T TAKE AN ARTIST TO NOTICE."

What do you think is the most gratifying aspect of being a 3D artist and specifically one who creates characters?

I love seeing my characters come to life, whether it's a 3D character running around in a game or a statue with a dynamic pose where you can practically envision their next move.

I've always been drawn to character art as opposed to inanimate objects like vehicles and buildings etc. I think this is because I really enjoy the challenge of making humans. When humans are badly represented, it doesn't take an artist to notice. Someone who is not artistic may not be able to pinpoint what's wrong, but the human eye picks up on the slightest error relating to anatomy, pose or lighting.



JOE VS. COBRA
GREGORY CALLAHAN '08

Do you think you would be more interested in modeling inanimate objects if they were to be animated and given personality, such as the characters in Pixar's *Cars* movies? Or is it more to do with the form and the fact that humans are more complicated?

Honestly if I were an animator my preference of subject matter would probably be different. Seeing a car behave like a human is pretty impressive, not to mention entertaining. I think I really just enjoy anatomy. The fact that we all have the same basic features (eyes, mouth, hands, feet, etc.,) but with subtle variations making us look so different is something that just fascinates me I guess.

Gregory Callahan

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Email: callhangregory@gmail.com
Interviewed by: Richard Tilbury



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3D CHARACTER DESIGN SERIES
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03
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Luxology®













the GALLERY

This month we feature: David Jankes | Weilongzhang | Bruno.Melo | Rakan Jandali
Hugo Leygo | Muhammad Sami | Artem Volchik | Albert Farrakhov | Jorge Lopes | Mauricio Lagosta

Bed

Albert Farrakhov
http://fandia.wix.com/cgfandia
fan3d@mail.ru
(Right)



The Black Sofa

Rakan Jandali
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BABOOSH

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Nosferatu

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G.N.R.I.C. Trooper

Bruno.Melo

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(Top Right)



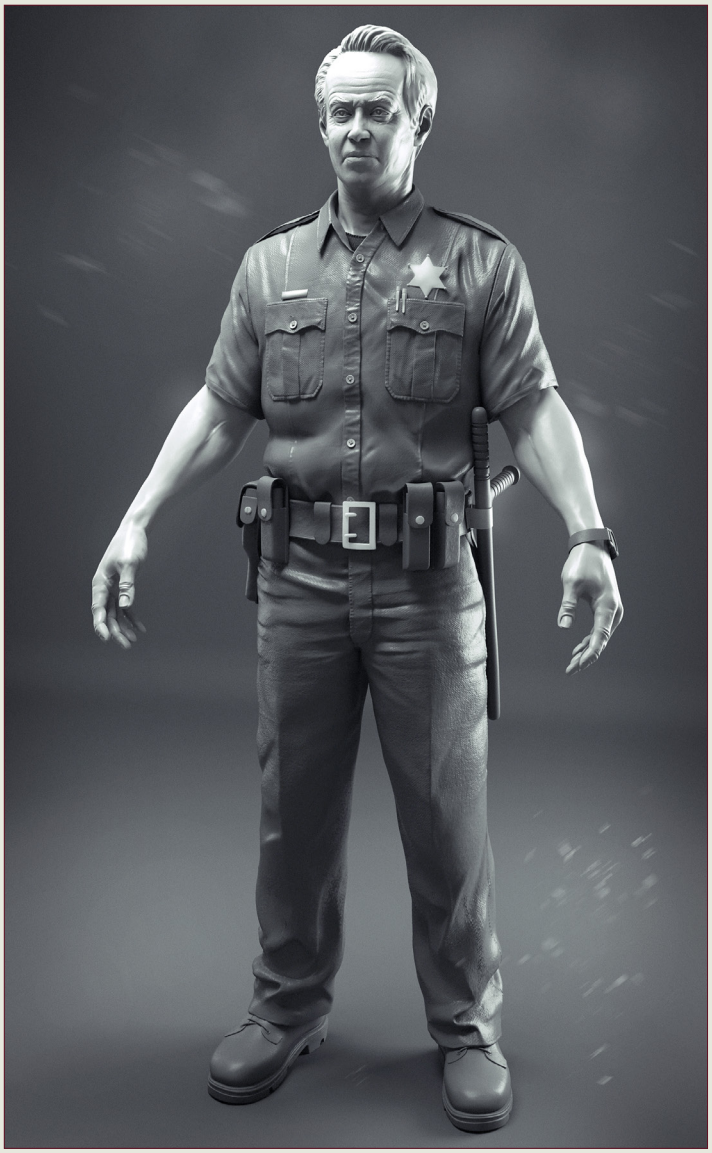
Clay Model of Policeman

David Jankes

http://www.yeenke.com

yeenke@gmail.com

(Bottom Left)



Jinni

Muhammad Sami

muhammadsami86@hotmail.com

Character concept sketch by Ahmed Fathi

(Bottom Right)





TR//001 Race Car

Artem Volchik

http://www.artemstudios.com

artemv@gmail.com


A
RELLI
www.artemstudios.com © 2012

Dead Line

Weilongzhang
417985742@qq.com
(Right)



Let There Be Nerds!

Mauricio Lagosta
http://www.behance.net/mauriciolagosta
mauricioasa@gmail.com
(Below)



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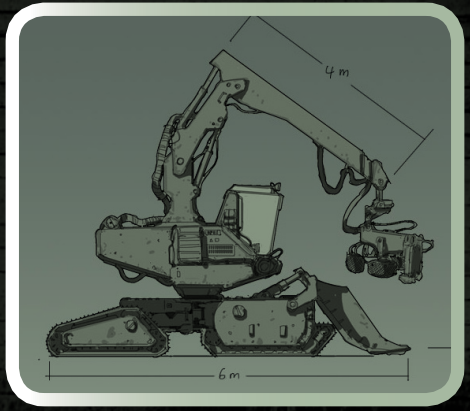
BEGINNER'S GUIDE TO MODELING

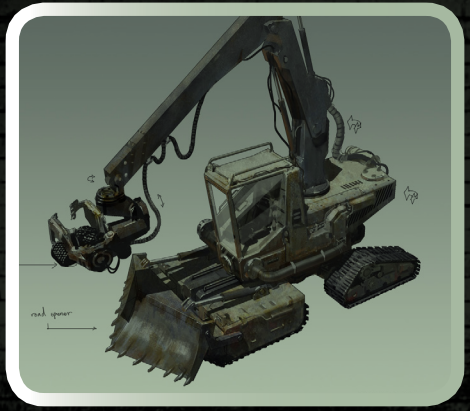
FUTURISTIC VEHICLES

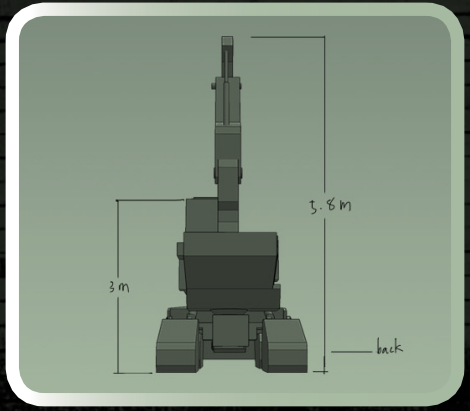


Futuristic vehicles are a common subject matter in the CG world. However, in this series we will be approaching creating futuristic vehicles in a slightly different way. Our two amazing artists have been provided with a 2D concept and technical drawing of a destructive deforestation vehicle. Over the eight-part series they will detail a step-by-step guide on how to turn this 2D information into an accurate and exciting 3D model, from the initial modeling phase through to the final rendering.

3ds max







CHAPTER 01

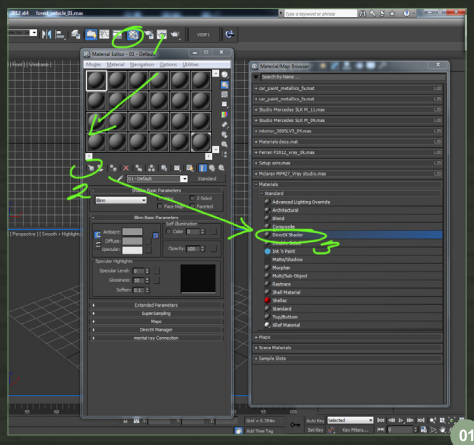
Software used: 3ds Max

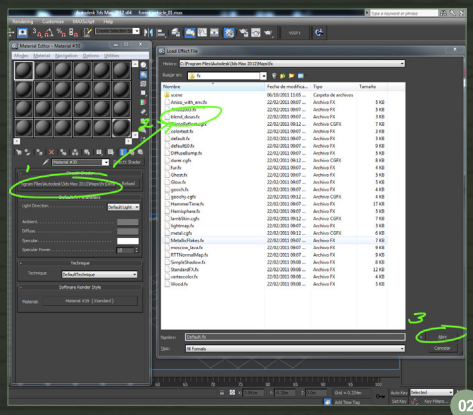
INTRODUCTION

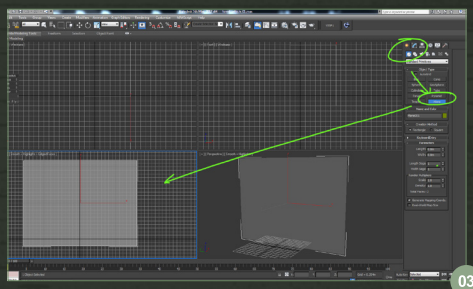
In this tutorial series we will create a complete 3D model of a forest vehicle. We will see the model develop from the placement of our reference or blueprint in the viewport, through to modeling all the parts of our vehicle in detail.

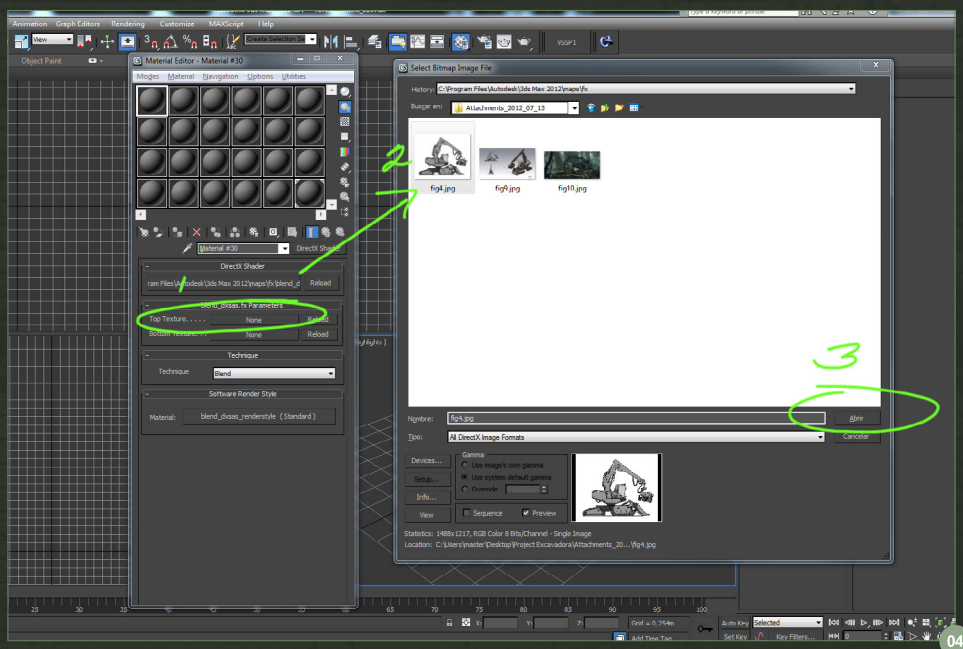
I will demonstrate how to prepare the different parts with the Unwrap tool UVW in 3ds Max, ready for texturing later on in Photoshop. I will also take you through lighting the scene, preparing the rendering engine and the final presentation, which is based on a sketch of a concept vehicle.

The first step is to put the reference image in our 3ds Max viewport. For this we need to change our Material Editor to the material named "DirectXShader" (**Fig.01**). This will allow us to see the reference image in high quality and detail.





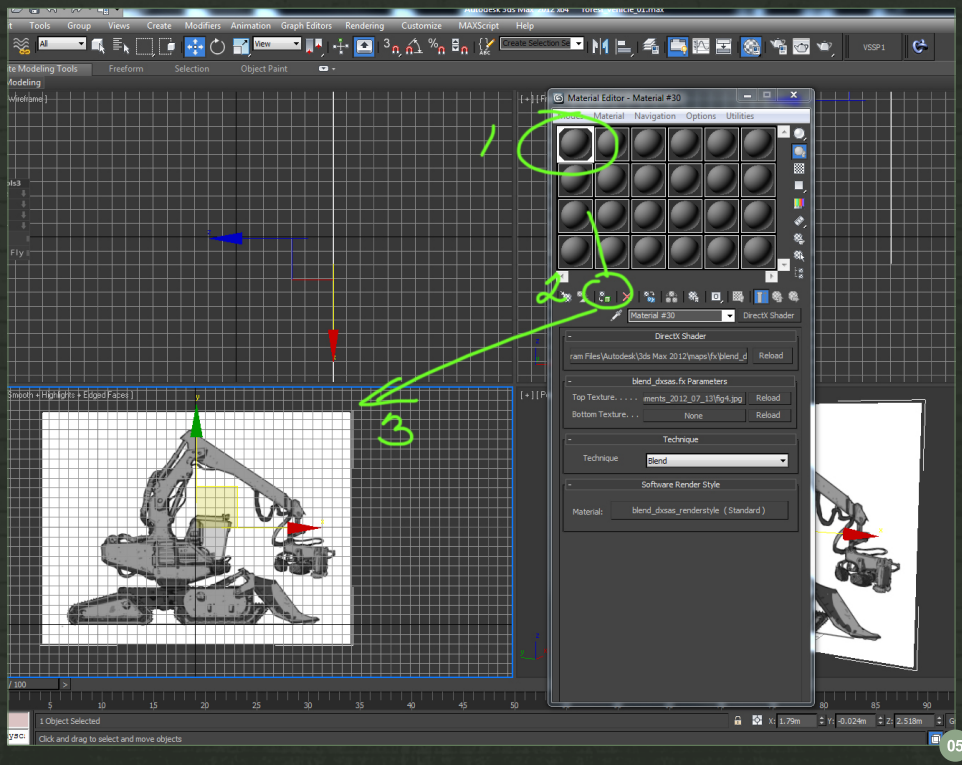




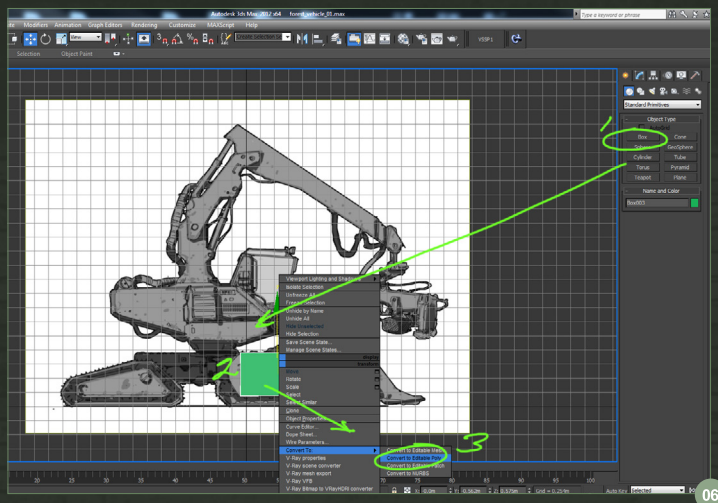
To load the image, click on the first button in the material parameters rollout and select the effect named "blend_dxsas.fx" (**Fig.02**).

To load the reference image, select Top Texture in the parameters rollout (**Fig.03**) and choose the appropriate image. Create a plane in the left viewport; in this case I'm using a plane of eight meters wide and six meters high (**Fig.04**).

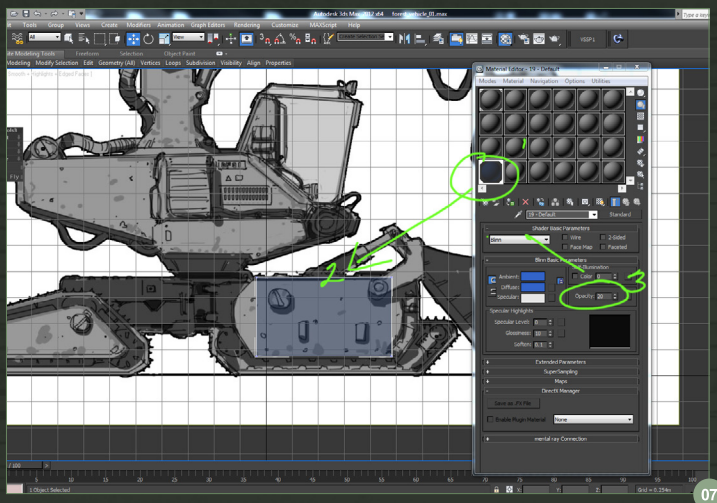
Then assign the reference image you loaded earlier to the material for this plane (**Fig.05**).



To get an idea of the dimensions of the model I suggest creating a basic reference model. To



06

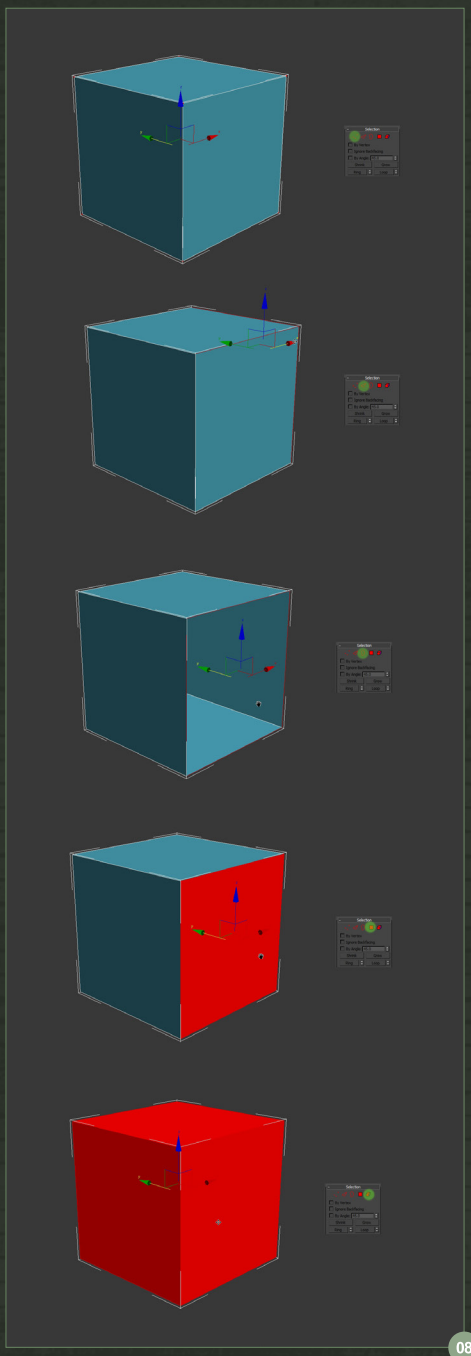


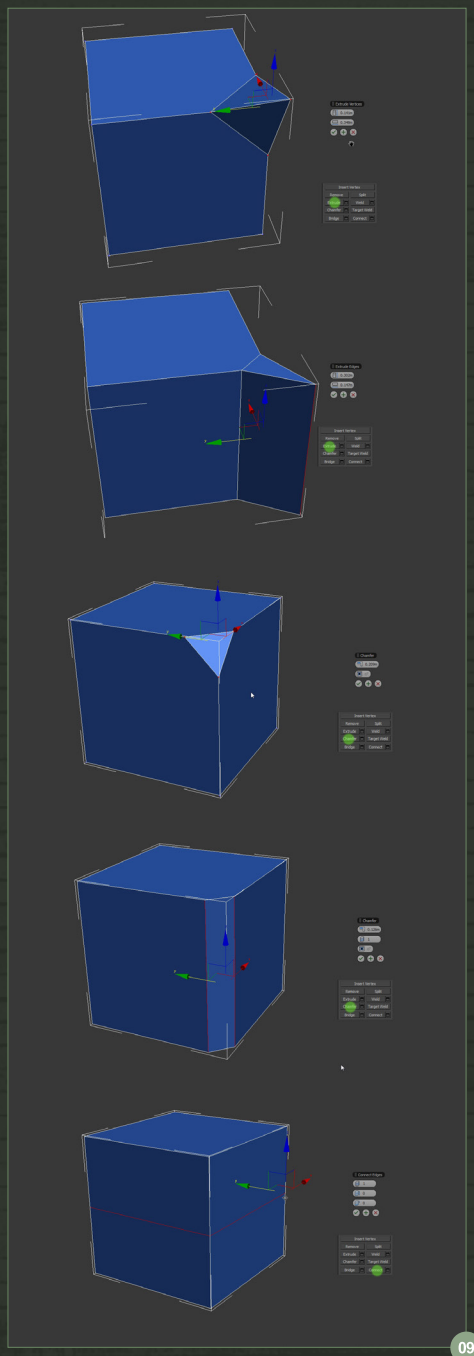
07

do this, use a box that you have turned into an editable poly (**Fig.06**). Assign a material to this box and set the opacity value to 20 (**Fig.07**).

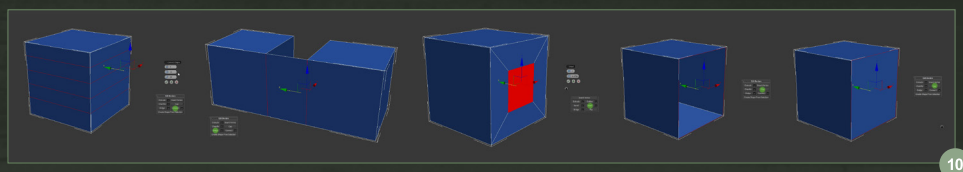
Before we move on to modeling and editing the box, let's look at some of the modes that we will need to use when editing the box. If you look at **Fig.08** you will see that I have highlighted in green the different tools we will be using which can be found in Sub-Object selection mode. Starting from the top and working down, the first tool is for editing vertices. The second tool is for editing the different edges on the box. The third tool is the Edge Loop tool and you will see what that does later in the series. The fourth tool down is Polygon Mode, which allows you to edit the faces of your geometry. Finally, the last example is Elements Mode, which is for selecting and working on separate bits of geometry that aren't welded together.

The next things to consider are the tools that we will use to edit the mesh. Again we will start at the top of **Fig.09** and work our way down. The tool used in the first two examples is the Extrude tool. This tool allows you to pull out (or extrude) edges in the viewport. This is done simply by clicking on an edge and dragging it. The next tool down is the Chamfer tool. This tool basically chops out sections of your geometry. The final tool is the Connect tool. The connect tool allows you to adjust the distance and position of different parts of your geometry. You will see this used later.


08

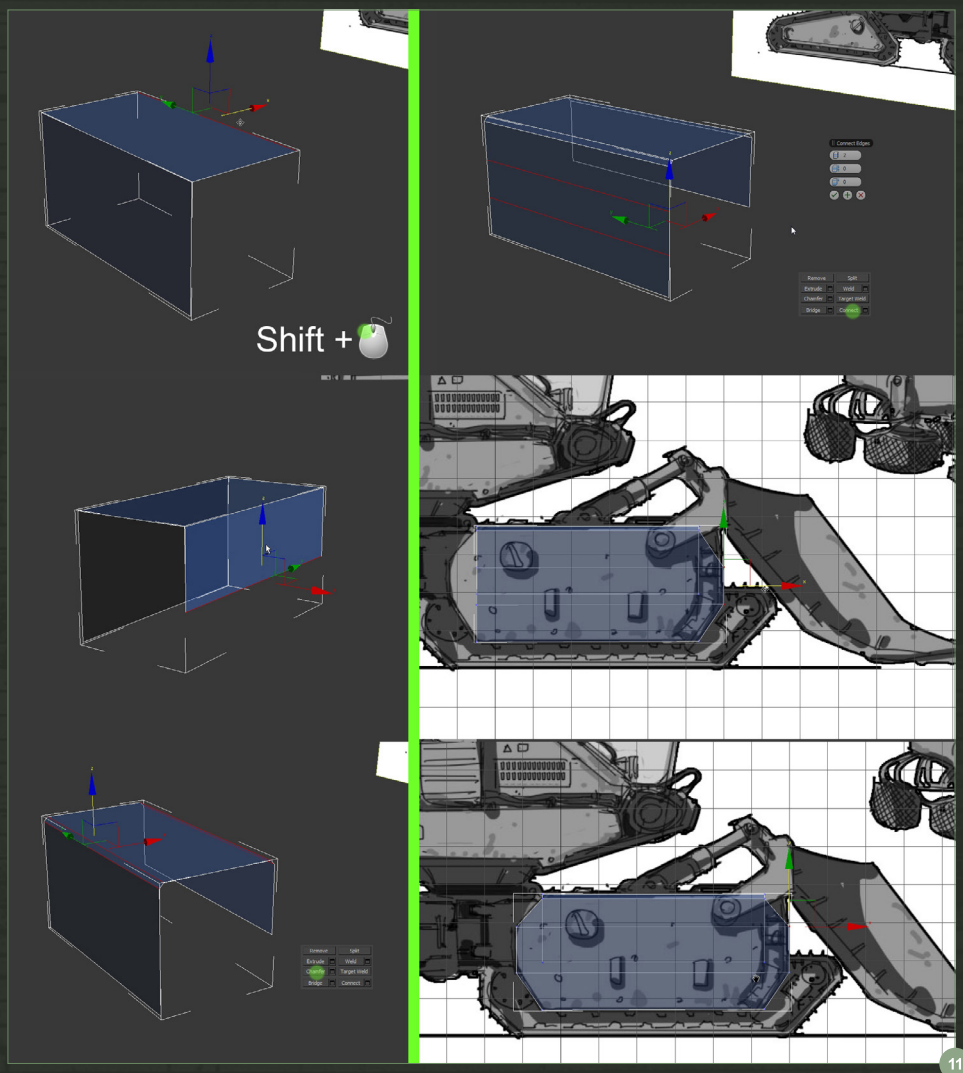

09

There are a few other tools that we will use, but not very much. These are the Bridge tool, which helps you to join up two separate edges; the Inset tool, which helps you select sections of the geometry and manipulate them; and the Cap tool, which you use to fill holes (**Fig.10**).

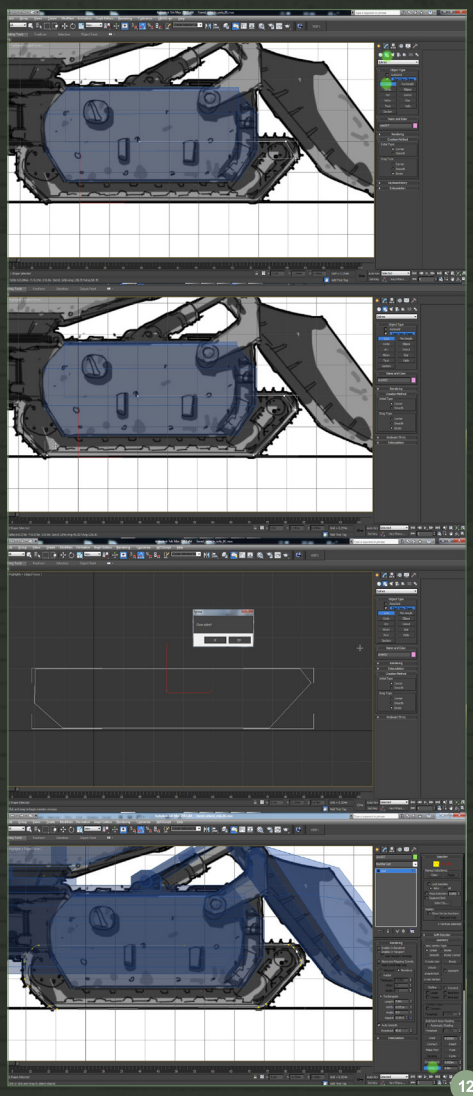

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Volumetric Model

Go to the plane you created earlier and select the top edge using the keyboard shortcut Shift + left click. Extrude the edges and the shape until it covers the shape of the front track. Select the edge of the plane and divide it into three segments (**Fig.11**).



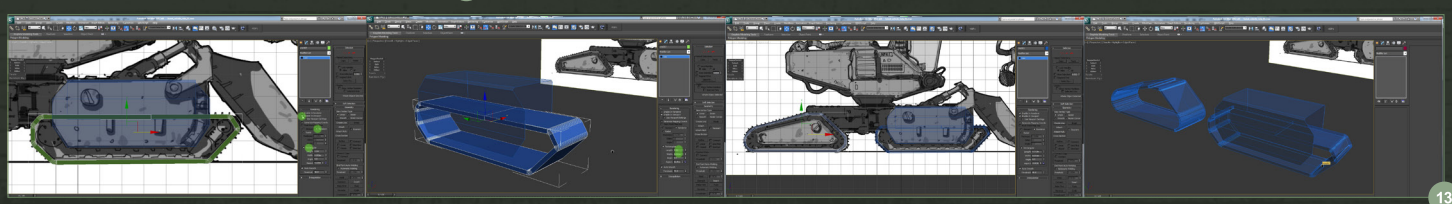
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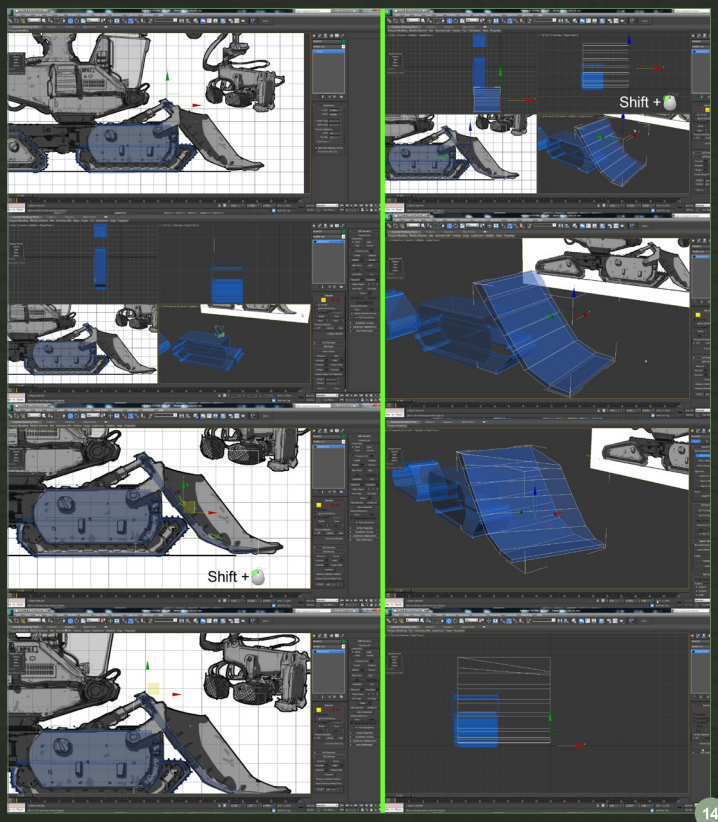

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To make the tracks that the vehicle would move on we are going to use splines. Splines are very much like editable polys as they have their own selection parameters which work in similar ways (**Fig.12**).

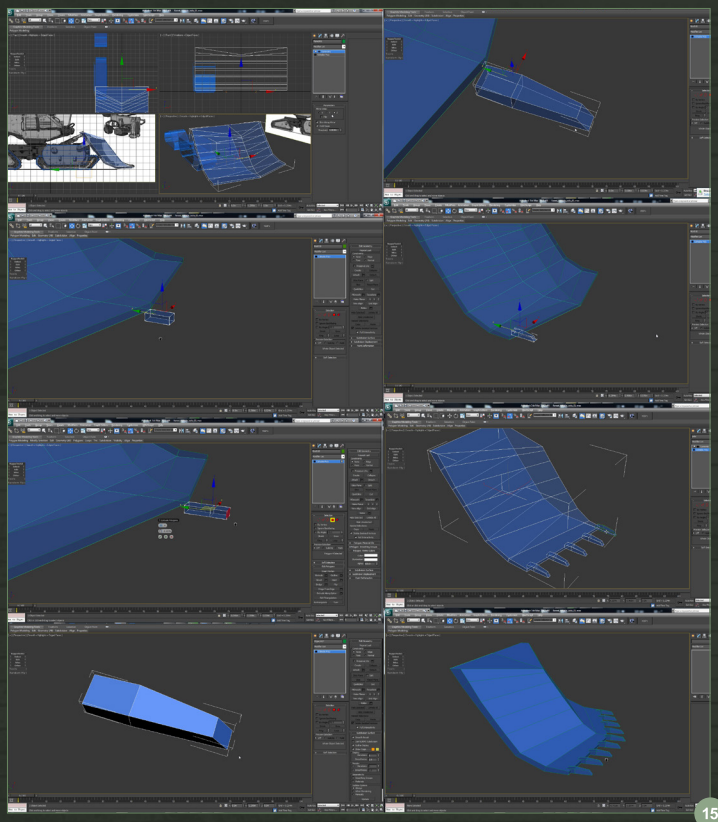
Start in one of the corners of the tracks and create a spline that follows the shape of the track until it ends up back where it started. When you get back to your starting point it will ask you if you want to close the spline; when it does this, click Yes. Go into Vertices Mode and select the Fillet tool, which you will see highlighted in **Fig.13**. Also select the Enable in Viewport option and adjust the shape until you are happy with it. This same procedure can be used to create the rear track.

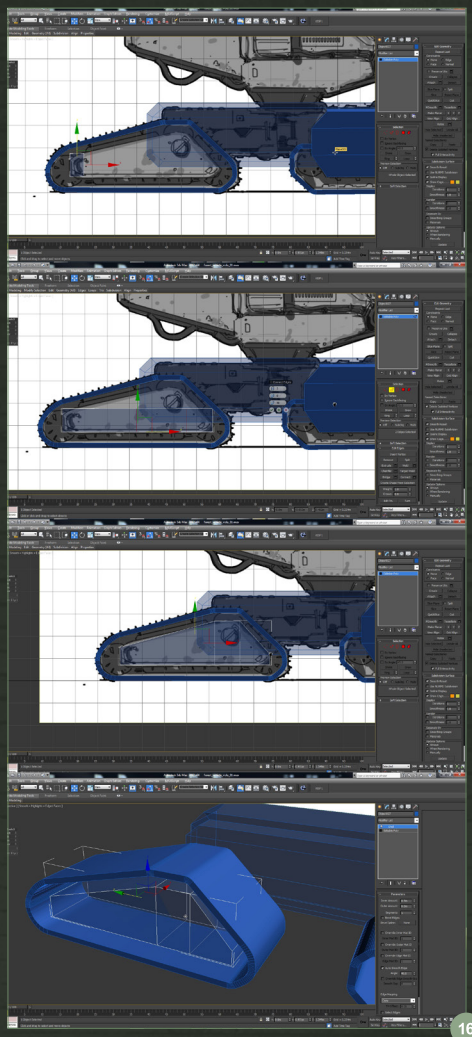
Continue to use the same technique to create the shovel on the front of the vehicle. Create a


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plane, turn it into an editable poly and refine it to make sure you have the correct shape.

Once you have done this you will have the basic shape of the different elements that make up a large amount of the vehicle. Select the edges of the starting geometry and extrude it sideways, as you can see in **Fig.14**. You will need to rotate around your vehicle in the virtual space to getter a better view of how the model looks when extruded. Once you have done this put 0.0 in the X,Y and Z co-ordinates at the bottom of the viewport to return to the standard view. This process will become really helpful later when there are multiple items in your viewport.

With your scoop selected, go to the list of modifiers and apply the Symmetry modifier on the Z axis. This will create the full scoop shape. With this selected and in Edit Poly mode, use the Extrude tool to pull out the shape that you will see in **Fig.15**. You can rotate around the image to see if this matches the concept.

The next step is to create the teeth for the shovel. Create a new small box and turn it into an editable poly. Extrude one side and adjust it slightly to create a tooth shape (as shown in Fig.15). Reproduce it until you have five and place them on your model. With the Symmetry modifier on you can duplicate them to create the other side of the shovel. Finally attach them to your model.

If you go back to your starting view, the next step is use the Symmetry modifier to make the complete shape of the vehicle. Once you have done this, create a new plane to create the interior part of the rear track. Extrude the edges of the plane to match the shape in the concept. Once you have done this select this geometry and select the Shell modifier (**Fig.16**).

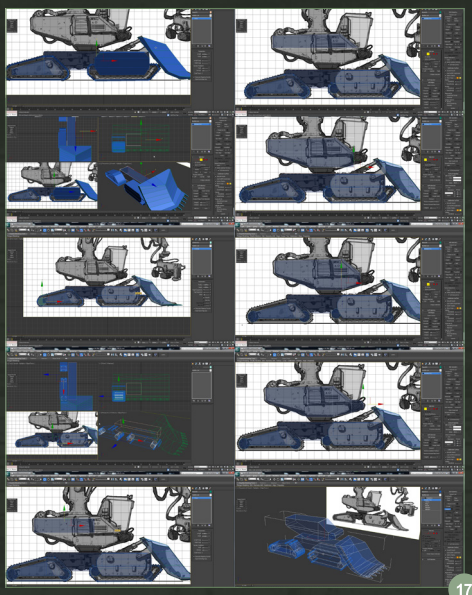
The same process will be repeated to create the part of the vehicle that sits behind the front track. Create a plane and turn it into an editable poly. Extrude it to match the shape in the concept. Extrude this shape in the same way as you have done for the other elements in the viewport. Do the same for the main body of the vehicle and attach the different elements together (**Fig.17**).

The next step is to create the small cabin on top of the main body of the vehicle. Again this can start as a box that is extruded to match the concept. The difference with this piece of geometry is that you will use the Inset tool described earlier to select the faces on the top and extract them to create the raised section on top of the cabin. You will need to use the Cap tool for this section. Once you have done this create two simple circle shapes that can be placed to create the lights on the cabin (**Fig.18**).

Mechanical Arm

The final thing to do at this point is to create the mechanical arm. To do this we will use splines as it is a complex shape. Use splines to follow the contours of the shape of the arm. To create the cylinder that sits under the arm, create a circular shape and extrude it into place.

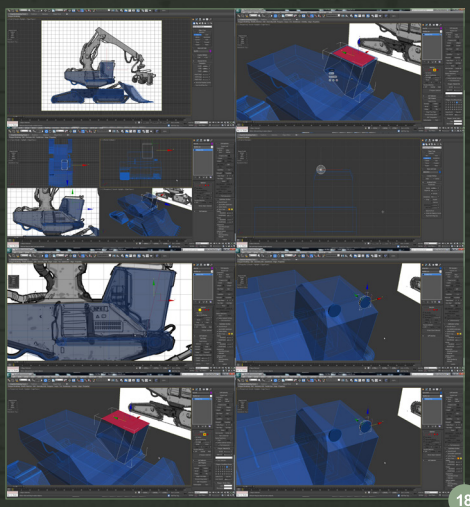
To create the wires use the splines and extrude again, but to make it softer and rounder this time, give it more sides so it has cylindrical qualities. The settings for this can be seen in **Fig.19**.

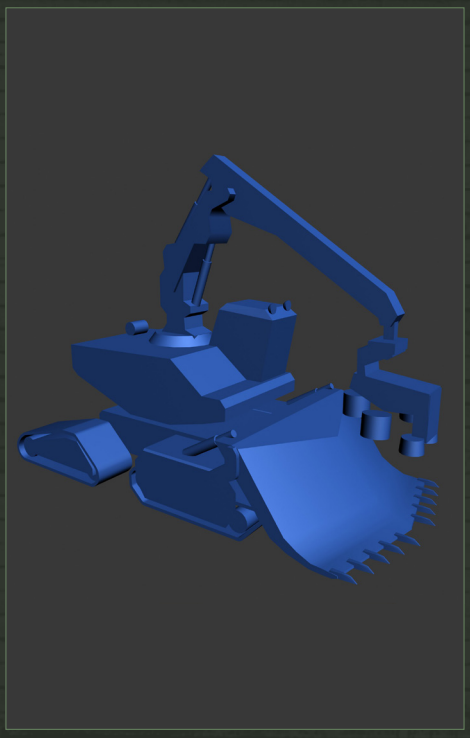

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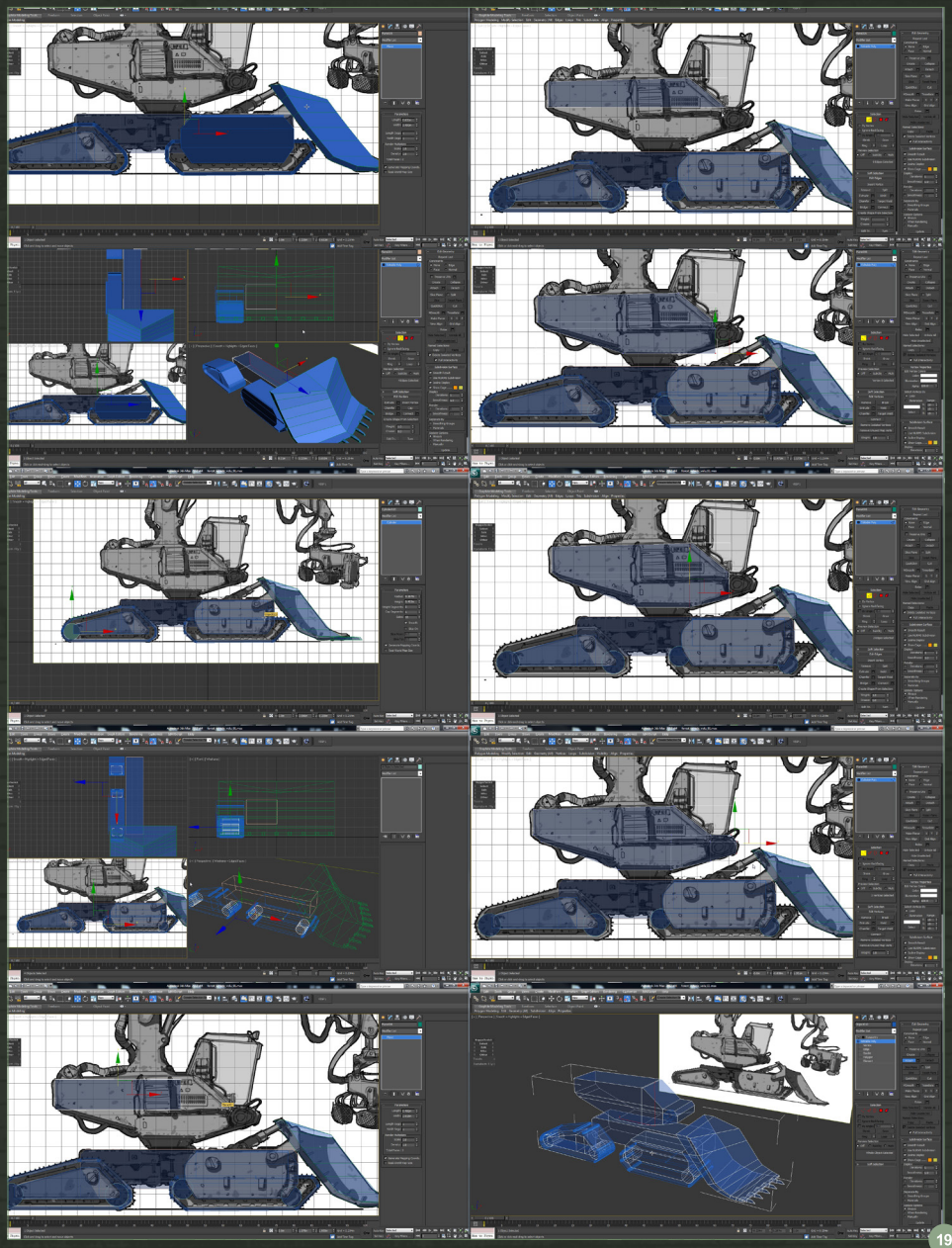
Arturo Garcia

Web: http://dessga.cgsociety.org/gallery/

Email: dessga@yahoo.com.mx


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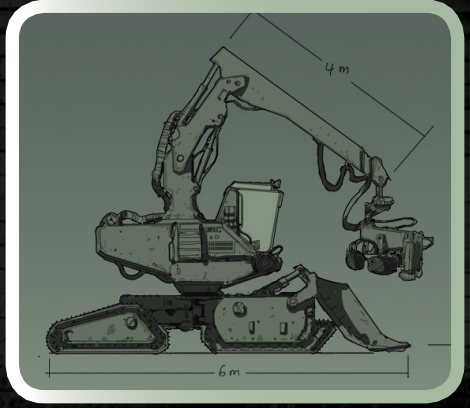
BEGINNER'S GUIDE TO MODELING

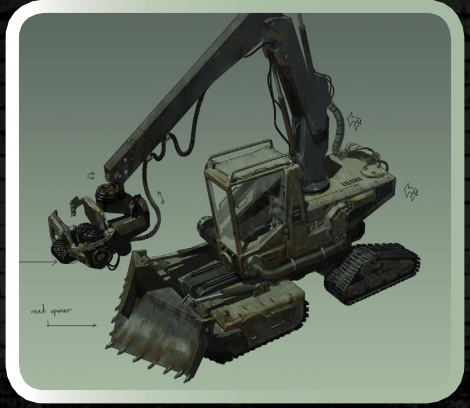
FUTURISTIC VEHICLES

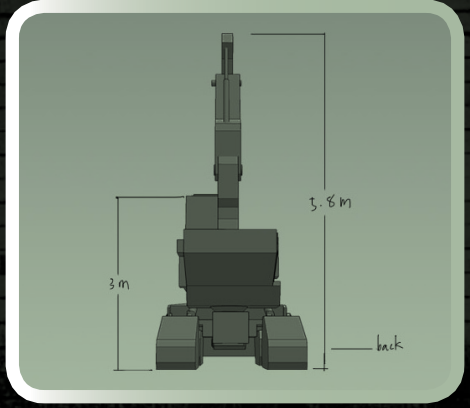


Futuristic vehicles are a common subject matter in the CG world. However, in this series we will be approaching creating futuristic vehicles in a slightly different way. Our two amazing artists have been provided with a 2D concept and technical drawing of a destructive deforestation vehicle. Over the eight-part series they will detail a step-by-step guide on how to turn this 2D information into an accurate and exciting 3D model, from the initial modeling phase through to the final rendering.

Maya







Chapter 01

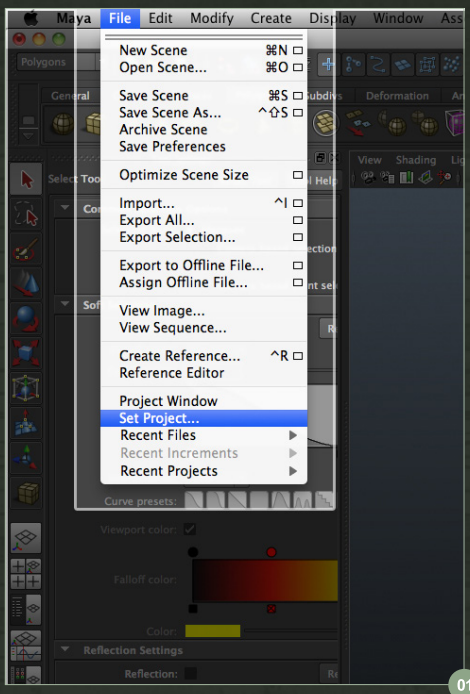
Software used: Maya

The modeling process in Maya can sometimes turn from enthusiasm into a nightmare, especially for beginners.

In this tutorial we will find a way to eliminate all kinds of distractions and potential problems right at the beginning. That includes having a fine-tuned workflow and creating shelves, but also planning out the process that precedes the modeling. So let's get started.

Setting up a Project

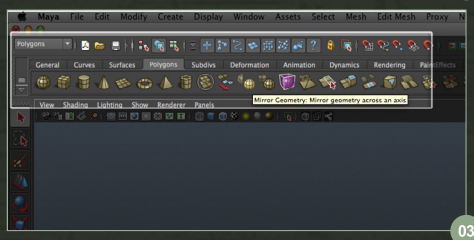
We're going to start by creating a new project, so go to the File menu and choose Set Project (**Fig.01**).



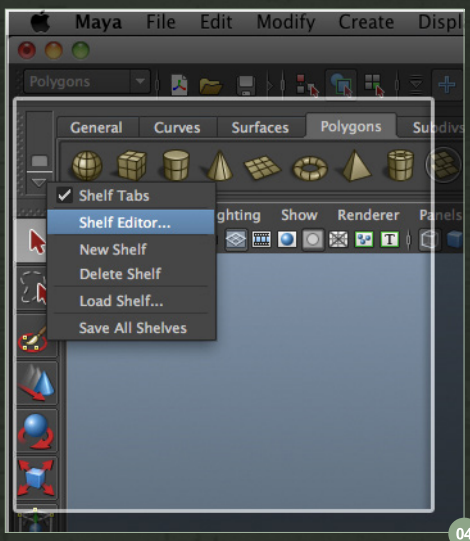
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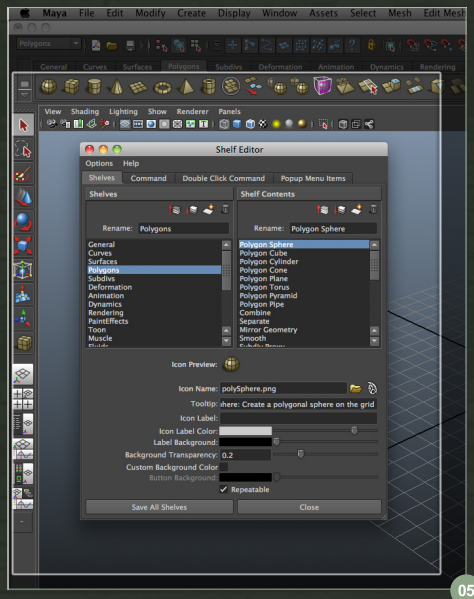
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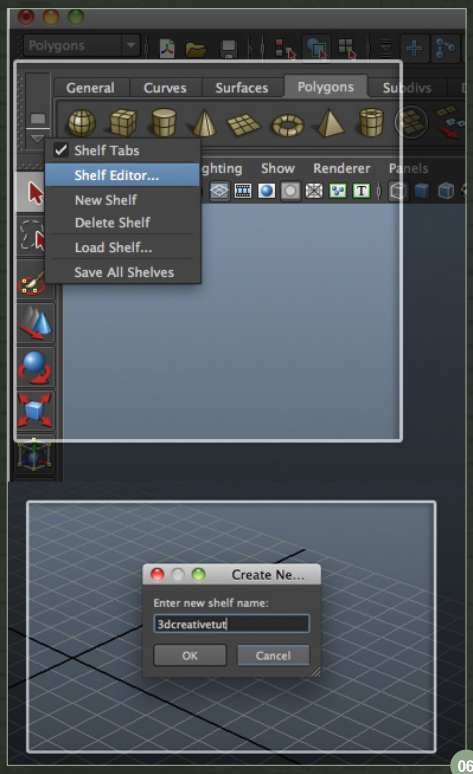
This will bring up a dialog box with a list of all the projects currently in your directory. Choose the project you're working on and click Set. Doing this tells Maya which project folder to save scene files into, and where to look for textures, geometry, scenes, etc. For the purposes of this tutorial, let's call the project "3dcreativetut" (**Fig.02**).



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Speed up the Workflow

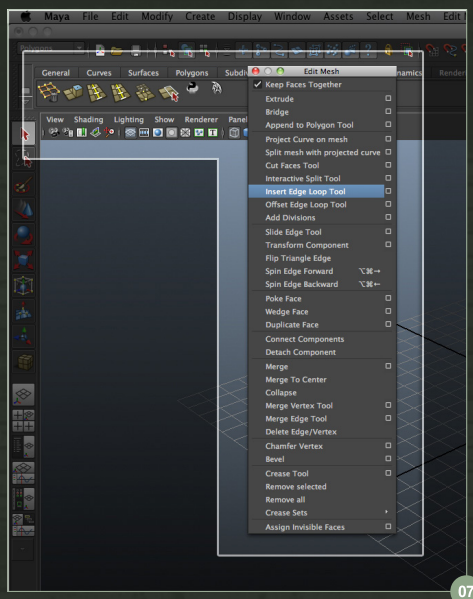
Speeding up the workflow you use in Maya is one of the most important aspects when we tackle a project, and having quick access to software tools is undoubtedly the best way to save time.

The tool shelf allows you to access the most commonly used functions within Maya. By default, Maya comes with this pre-set tool shelf (**Fig.03**).

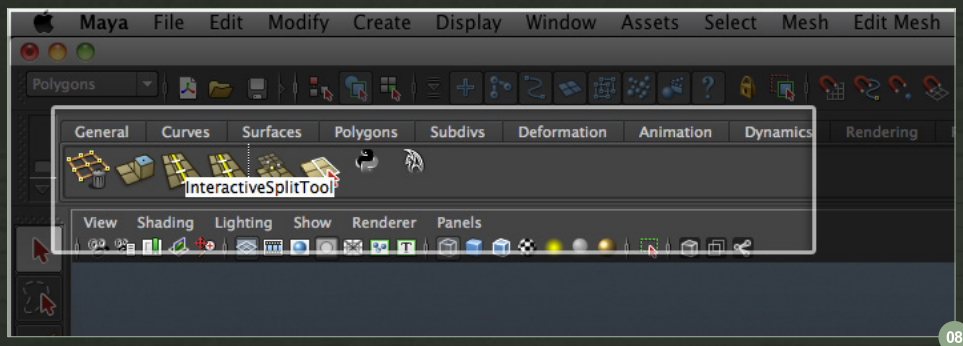
The Shelf Editor allows you to create new shelves or edit current ones, as well as giving you the option to rename, add/delete, change icons and backgrounds etc. What we want to do right now is simply set up our own custom tool shelf, so that we can quickly access the tools we're going to need to use in this tutorial (**Fig.04 – 05**).

Click and hold the upside down triangle and choose New Shelf. Maya will ask us the name of the new shelf, so let's call it "3dcreativetut" (**Fig.06**).

Then add some commonly used functions for modeling. Make sure you have Polygons selected (**Fig.07**).



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To add functions to your custom tool shelf, hold down Ctrl + Shift, go up to any drop down menu and begin selecting functions. They will then begin to appear on your shelf. Add the following functions:

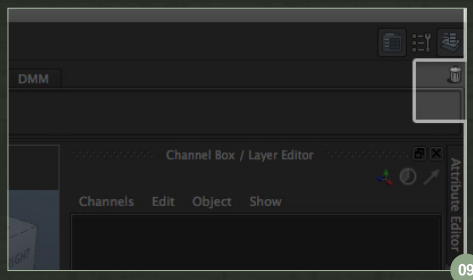
- Create Polygon tool
- Extrude
- Cut Faces tool
- Interactive Split Polygon tool
- Insert Edge Loop tool
- Merge
- Basic shapes such as sphere, cube, plane and cylinder

Moving icons on your tool shelf is simple. You can either go to the Shelf Editor, or simply click the middle mouse button whilst on the icon and drag it to a new location on the shelf (**Fig.08**).

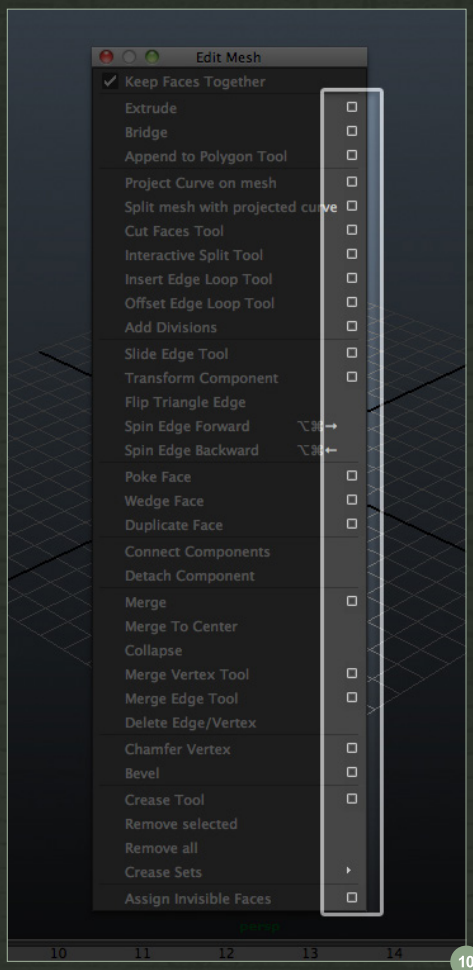
Deleting icons from your tool shelf is simple as well. You can delete them by going to Shelf Editor, or again, clicking the middle button on your mouse and dragging the unwanted icon over to the trash can on the right-hand side (**Fig.09**).

Many of the functions in Maya have options that allow you to modify how that function behaves. You will notice that a lot of the drop down functions on your Menu list have a square box off to the side. This means that this function has options that you can set, if you choose to (**Fig.10**).

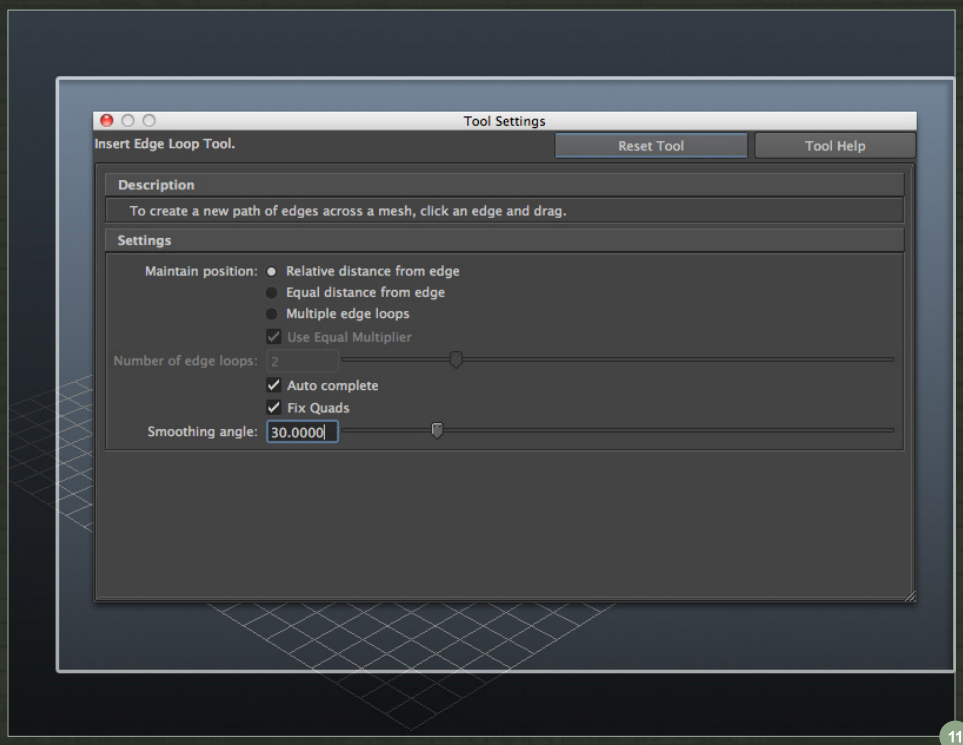
If you've already placed the function on your tool shelf, you can access the option box by simply double-clicking on the icon from your tool shelf (**Fig.11**).



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Import the Images

The image plane is very useful when you are modeling in Maya. In this example I will use the front view of my vehicle. Then go to View > Image Plane > Import Image (**Fig.12**).

When the window opens, just browse for the image that you want to import. When you have your image selected, click Open and this will place the image on the view (**Fig.13**).

On the Attribute Editor we will find imagePlane – this contains the name of our image, in my case "front". If you want to see the image in all views set Display to "in all views"; if you want to see it only in the view that you imported it in set Display to "looking into the camera". This makes sure that if we move the right view of our perspective then the image plane will only be displayed in our front view (**Fig.14**).

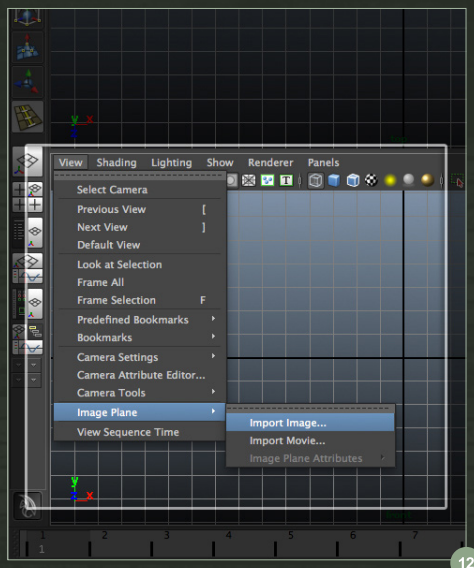
To change the position of your image just scroll down the panel and adjust the parameter (**Fig.15**).

Another way you can do it is to make a poly plane. Go into your Hypershade and make a Lambert and drop that into it, then plug your file texture into the color of that Lambert (**Fig.16**).

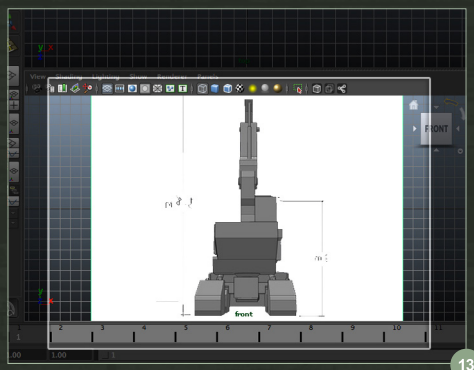
Modeling

The best way to start a 3D model is by blocking in shapes, basically making a low poly version of our model. "Won't we waste time?" I hear you ask! The answer is no, because if we work in a low poly version before the final version, we can solve problems of proportion that will be presented in the future, and we will have a clear idea of how the model works in space.

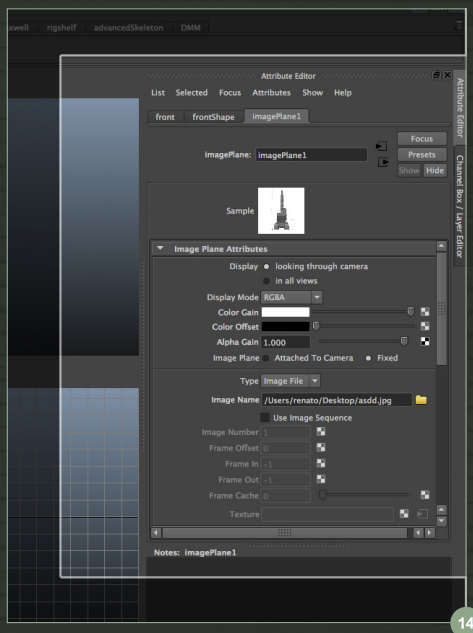
It will also give us the basis to begin modeling our high poly version, and most importantly, it will help us to create a mental guide to understand the three-dimensionality of our 2D concept.



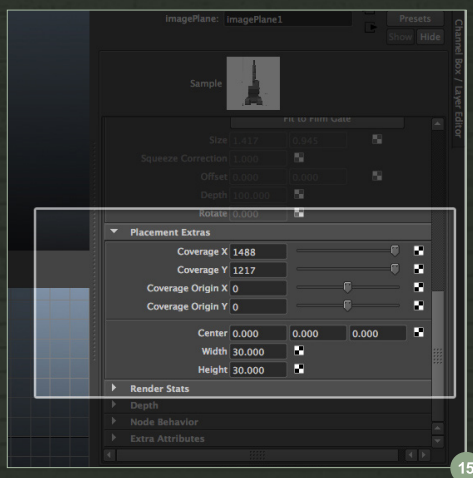
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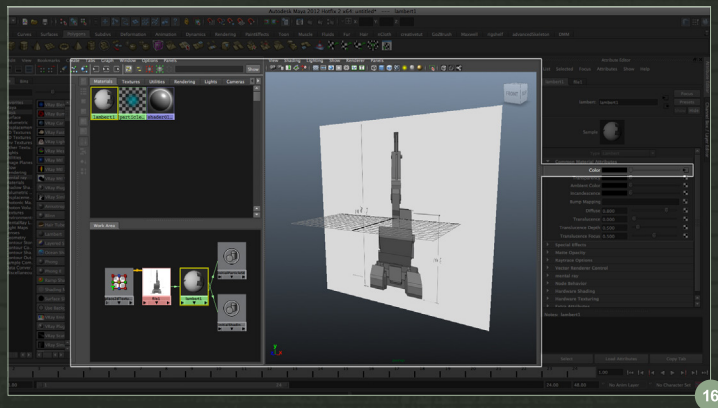
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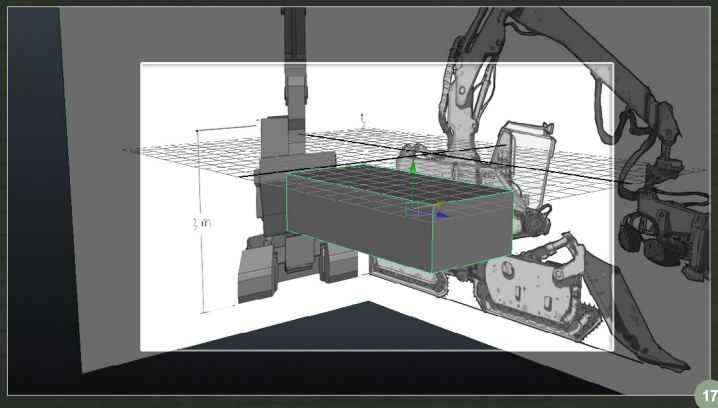
The Body

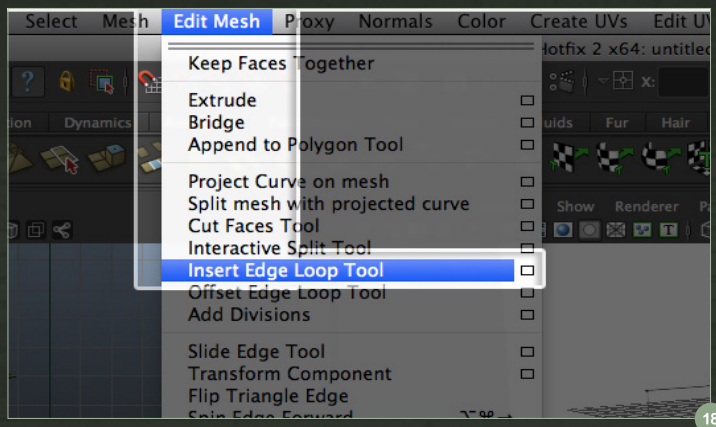
We start by creating the body of our machine from the geometric shape that is closest to our concept, which is obviously the cube.

Click on Create Cube, and then drag the mouse onto our view by pressing the left button (**Fig.17**).

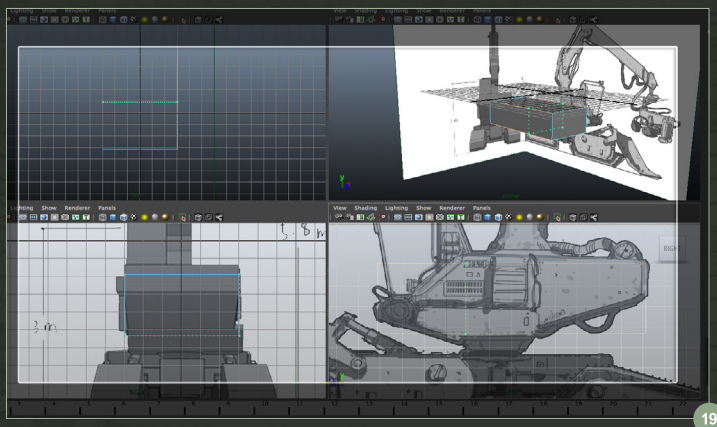
Once the cube is created, add Loops, with the idea of adding more geometry to our cube. We will use the Insert Edge Loop tool for this.

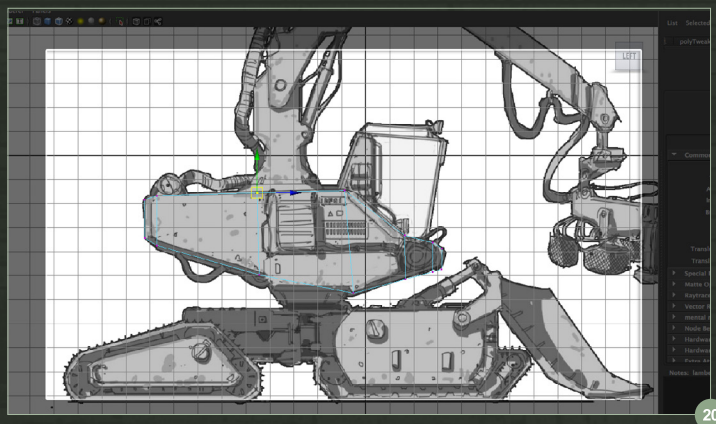

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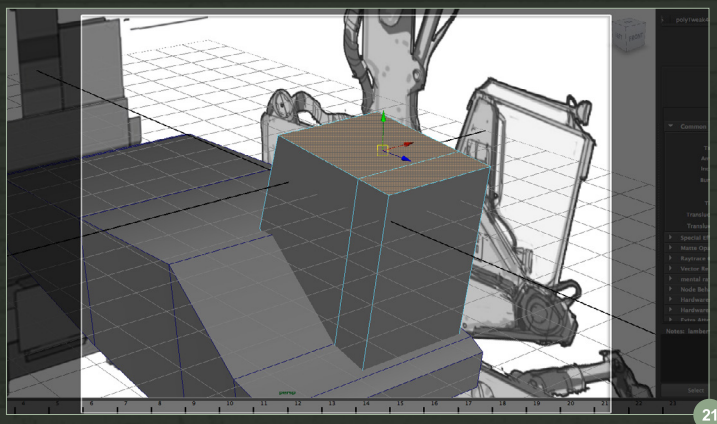

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The Insert Edge Loop tool is probably the single most important item in your modeling tool-set. It allows you to add additional resolution to your mesh by placing an uninterrupted subdivision in any location you specify.

With the cube in object mode, go up to Edit Mesh and select the Insert Edge Loop tool (or select it from your custom shelf) (**Fig.18**). Click any edge on your mesh, and a new subdivision will be placed perpendicular to the edge you clicked.

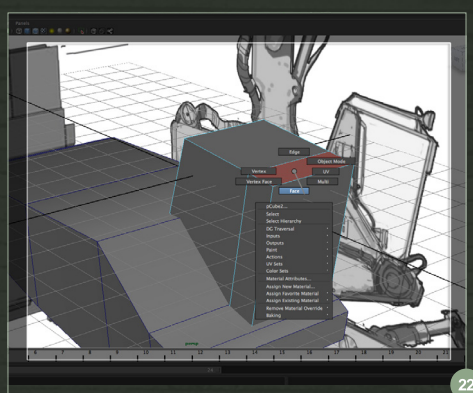
You can add additional subdivisions anywhere on your model by clicking and dragging on any edge (Maya will not drop the new edge loop until you release the left mouse button) (**Fig.19**).

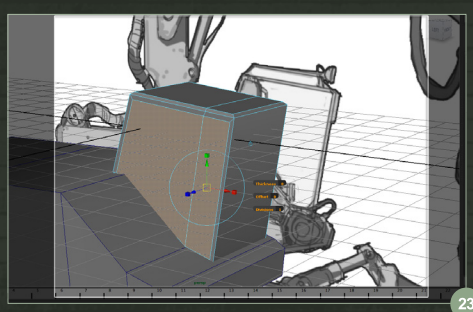
Then by selecting the vertex selection mode (right mouse button), we can start to move the points following the reference image (**Fig.20**).

The Cab

As we did with the body, we will start from a cube for the cab. Most of the process will be the same, but to create the side bars we need use the Extrude tool (**Fig.21**).

Extrude creates new geometry from a selected component. This selected component can be vertices, edges, or faces; the most commonly used is faces (**Fig.22**).


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The Extrude tool works by Maya creating a node called "polyextrudeface". This node contains all the attributes for the extrusion. These attributes are changed by visually setting them using the manipulator (**Fig.23**)

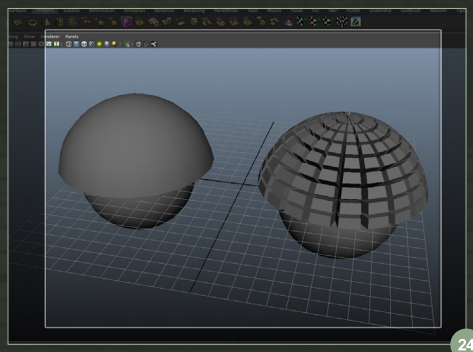
When you're using the local mode for the Move tool, the local translation attributes will change. If you're in world space, the normal transform attributes will change.

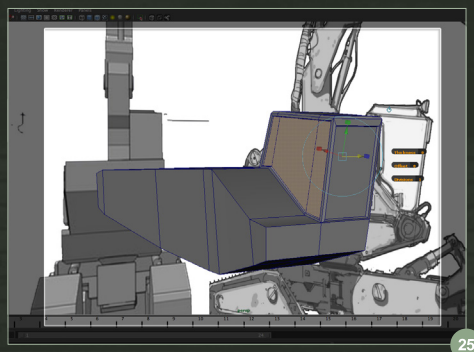
The various extrude attributes that are available are as follows:

- **Translate Attributes:** This is the location of the extrude in world space.
- **Polyextrude Curve Attributes:** These attributes will be covered in the extruding along a curve section later.
- **Divisions**: This is how many divisions will be added along the extrusion.
- **Offset**: An offset value for the local translates.
- **Local Translate:** This is the location of the extrude in local space.

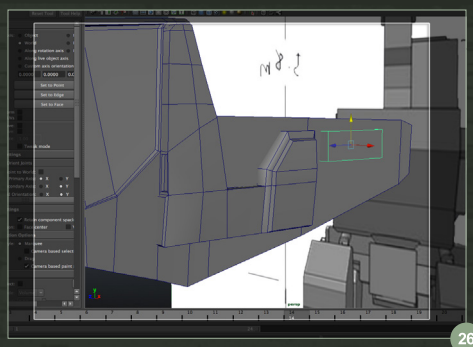
- **Local Direction**: The direction of the local axes.
- **Random:** Basically makes the extrude random.
- **Smoothing Angle:** This is in regard to the normals.

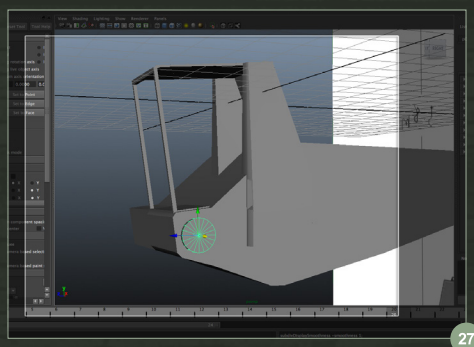
Fig.24 shows the difference between an extrude with Keep Faces Together on and an extrude with it off.


24

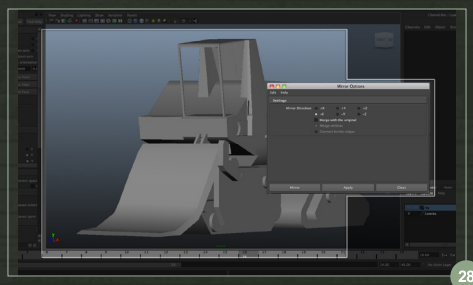

25

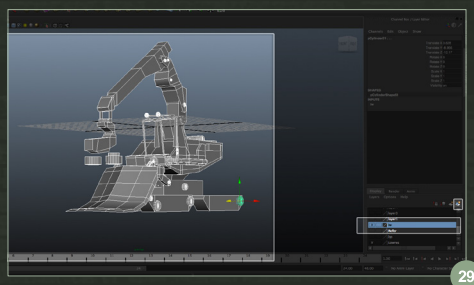
So we select the face that we need to extrude and press Extrude. Then we adjust the position to match the image reference (**Fig.25**). In this case we need a cylinder (**Fig.26**) or circle (**Fig.27**), but whatever shape you use, it's always the same workflow.


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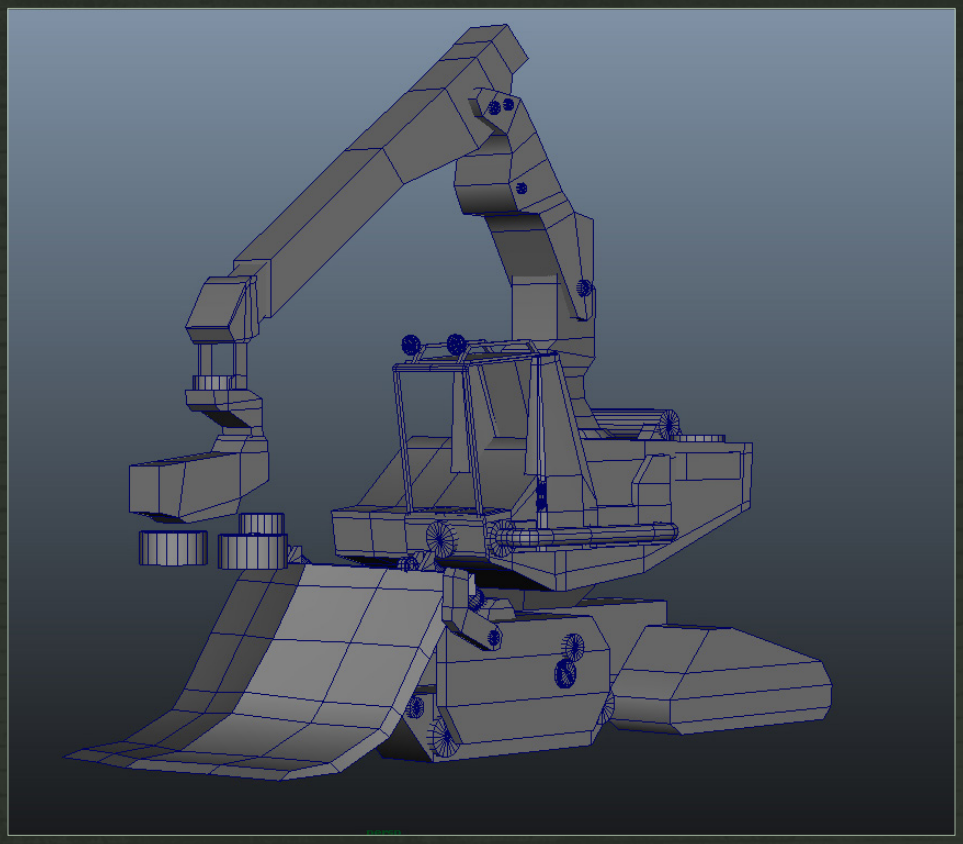

27

Mirror Geometry specifies the direction you want Maya to mirror the selected polygonal object. By default, the direction is +X. Change these options and click Mirror if you want to mirror the object in another direction; in our case this will be –X (**Fig.28**).


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Once we have finished the blocking, the next step is to select all the geometry to create a new layer called LW. This is so that when we need to hide or lock the objects in the scene, all we need to do is press Create A New Layer and assign the selected object located in the Channel Box (**Fig.29**).



With this we have finished the first part of the series. We have set up the scene and blocked in shapes, and now we are ready to move on to the high poly modeling. In the next chapter we are going to start detailing the mesh, as well as immersing ourselves in the world of the MEL Script.

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BUILDING DROIDS



- Free Concept Art & Technical Drawings

IMPORTANT NOTICE!

Unfortunately due to unforeseen artist circumstances, we are unable to bring you the last installment in the Building Droid's series. In this month's magazine we have provided you with the 2D artist's concept and technical drawings, so you can still have a go at creating this bartender droid yourself. Please click the Download Resources button on this page to download.

BARTENDER DROID



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"I TRY NOT TO DAMAGE THE ORIGINAL RENDER IN ANY WAY AND SO I HAVE EVERYTHING SAVED IN DIFFERENT LAYERS WITH MASKS FOR BETTER CONTROL."

TEXTURING AND LIGHTING IN PHOTOSHOP

When creating a 3D still there are many approaches that can be employed and options chosen by an artist. In this detailed tutorial Aleksandar Jovanovic demonstrates how he used Photoshop to apply color to his textureless render. Aleksandar has created a diverse scene full of different colored items made from different materials to demonstrate the power and flexibility of Photoshop. Not only are textures resolved inside Photoshop, but the lighting is also added and adjusted there to complete the scene, and create a dramatic and creepy effect. If you enjoy this tutorial, why not check out *Photoshop for 3D Artists* in the 3DTotal shop for more similar tutorials.



Photoshop
for 3d artists | v1

Tutorial taken from 3DTotal Publishing's ***Photoshop For 3D Artists | V1***

See the end of this tutorial for details on how to claim 20% off this book title.

Texturing and Lighting in Photoshop

Software used: Photoshop

Introduction

In this tutorial I will be guiding you through the process of enhancing your still frame images with the help of Photoshop and various 2D techniques. I won't be using any type of plugins, and I'm going to show one way you can create your fine-looking images very quickly, and very efficiently, with enormous freedom.

Once you master the techniques I'm about to demonstrate it will mean that in very short periods of time you can produce production-ready concept art, or even final still frame images.

Of course this only applies to inanimate pictures, but can be a great foundation for some large texturing processes in animation production. When you define the look you're after, it's just a matter of trying to reproduce this same effect in a 3D scene without losing long hours to experimentation.

Another way to do this could be to use camera mapping techniques. With this little trick you project the final image through the camera onto the geometry and use it as a matte painting etc.

My scene for this project is fairly simple, with some basic shaders. It is rendered with mental ray, so for the glass and metal I used its native "mia_material", and for everything else I just used the default Lambert shader without changing any of the specific properties. This doesn't really matter that much because you can work the same way with any render engine around. I decided to work like this just to show how much you can achieve with what is a rather empty scene.



01

One more thing that's defined and is included within the render is the lighting, which is achieved with a few light sources and is really nothing fancy. Since it's set to be a night interior scene we have lights that mimic moonlight, candle light and some additional light coming from some sort of oven.

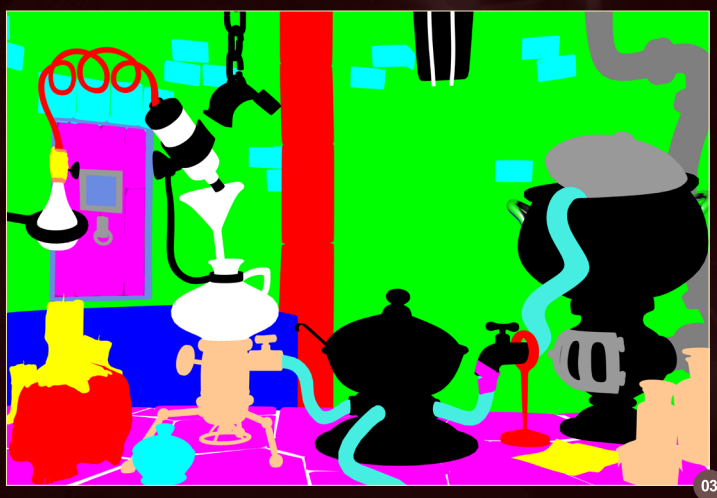
To create them I used point and area lights. I rendered out Beauty, Ambient Occlusion (AO) and Selection passes, which I created for the sake of fast selection, and that's about it. It's up to the artist how many passes he needs, but I chose those three (**Fig.01 – 03**).

The first thing I like to do is to color correct my image by adjusting levels, and to set some general tone for the image, or to be more precise, define a mood. Textures and paint-over's I will add later; first it is time for lightning.

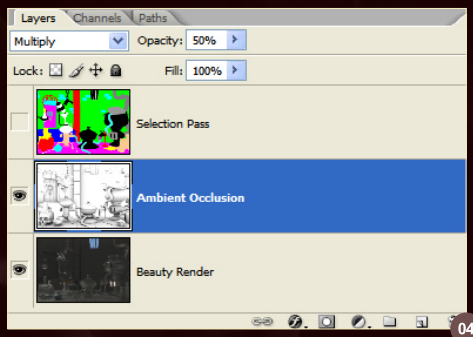
The Ambient Occlusion pass will introduce some very fine details. It is useful to mimic contact shadows. I put this layer on top of my image. I will even put all of my later textures below it. It is



02



03



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important to set the blending mode to Multiply, even if you paint your own AO layer. When I paint my own Ambient Occlusion pass I usually have two layers. In one of them I have harsh contact shadows and in the second one I have very soft shadows with falloff.

Later in the process I will mask out parts of AO layer that are directly lit with a light source, since there will be no shadows in those areas. Feel free to adjust the visibility of the AO layer because sometimes you'll need to combine more of them, but in this particular case I was satisfied with 50% visibility. There have been cases when I had to blur the AO pass for a much more compelling result (**Fig.04 – 05**), but not on this occasion.

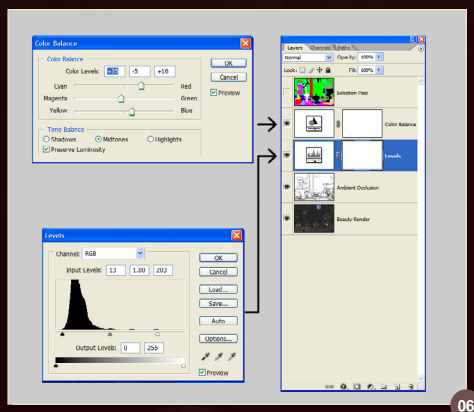
Since our image is still washed out we'll do some color correction next, using Primary Adjustment layers.

Quick Tip: I try not to damage the original render, in any way and so I have everything saved in different layers with masks for a better control. That way I can go back at any time and change whatever I like.


05

When it comes to color correction I don't have a precise recipe, so just use your judgement instead. As for myself, I like to use levels and color balance most of the time. With levels I will adjust the contrast of the overall image and with color balance I will tone it nicely. In this case I used some warm colors. In other words, I introduced some red and some blue tones.

One very nice thing about the Color Balance tool is that you can tone shadows, midtones and highlights independently. Color correct layers will stay on top of the other layers. At the very end I might come back and introduce some other tools (**Fig.06**). This is it. We might come back and do some extra correction later, but for now we'll concentrate on the lighting and background plate seen from the chamber window.



06

2D LIGHTING

I painted in some light effects using a very basic soft brush, varying its hardness and opacity according to the situation. In my experience the best way to do something like that for this kind of night scene is to use a bright orange color, and to set the blending mode of the layer to Color Dodge.

This also applies to daylight scenes, when you need some bloom effect from the sunlight. You can see how I used a harder brush on the metal pillar and a much softer one on the other parts, especially on those that are further away (**Fig.07**).

I tried to imagine the way the light would travel and bounce around the table and surrounding elements. The Selection pass helped me a lot here, otherwise I would have had to use various


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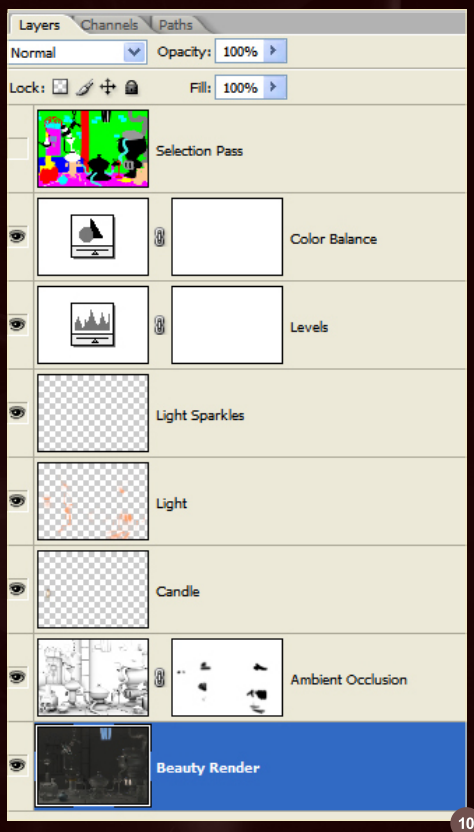

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selection tools, and spend some time doing it. This is also a part when you have to use your own judgment and logic or some artistic preference. For the candle flame I used a simple photo reference, and masked out areas outside of the flame. The only thing I left was a bit of the candle top, including wax (**Fig.08**).

With a hard brush with a small diameter, I painted small sparkles of dust illuminated by the flame, just to introduce some more details. To give more of a sense of depth I erased some of them, but I set the Eraser tool to a fairly low opacity. That way they fade out, but they do not disappear completely.

The ones I did not touch with the Eraser remain very bright, and these variations will make it more believable. Finally I masked out parts of the Ambient Occlusion pass where I don't have shadows. Those areas are the ones that are directly illuminated by light sources (**Fig.09 – 10**).

Around the candle I added one layer of very soft glow, to accentuate the hot air around it.
One more detail I painted in is a layer with red values just around hot areas of the image. I wasn't trying to be very precise here so I used a very soft brush and the same color value as for the light layer, which is orange. The blending



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mode was set to Color Burn. Finally I added some vignetting around the corners of the image (**Fig.11**).

At this point I was satisfied with the atmosphere, but what I realized was that certain parts of the image disappeared into the darkness. Not completely, but some very nice rim lights would help to separate them from the background. I used a dark cyan color for this effect.

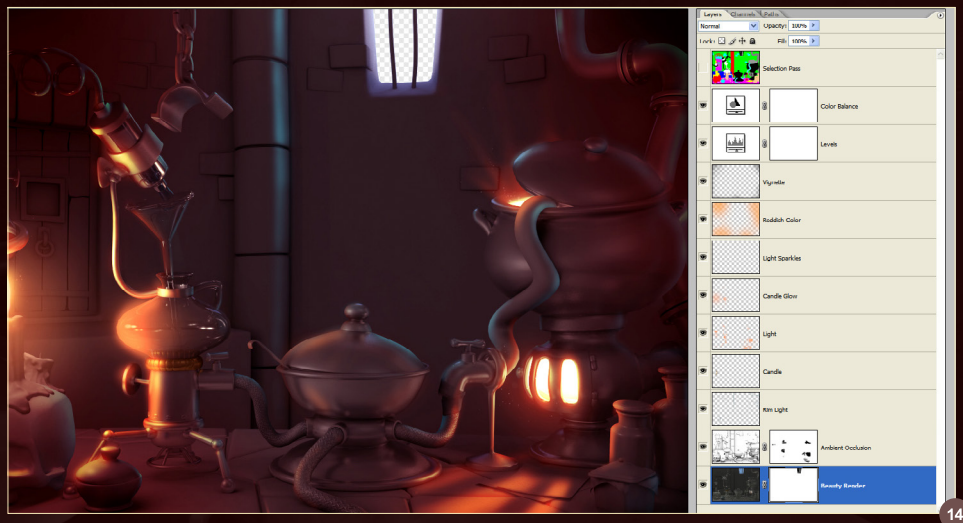

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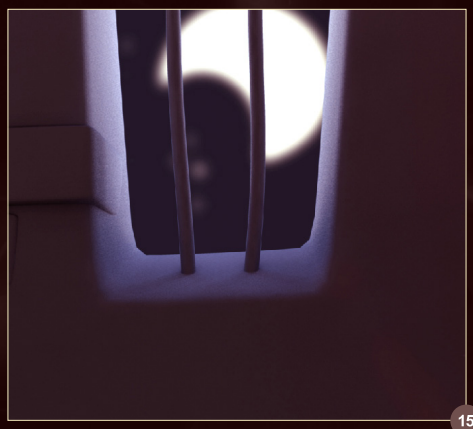
14

The layer's blending mode is set to Linear Dodge, but there are other combinations as well. This effect is subtle, but it can really help a lot. Later we can always come back and change the hue, saturation, lightness etc., because everything is saved in layers we have enormous freedom. In this situation the Selection pass I mentioned at the beginning helped me a lot, especially on the edges, but either way all you need is a trained and steady arm (**Fig.12 – 13**).

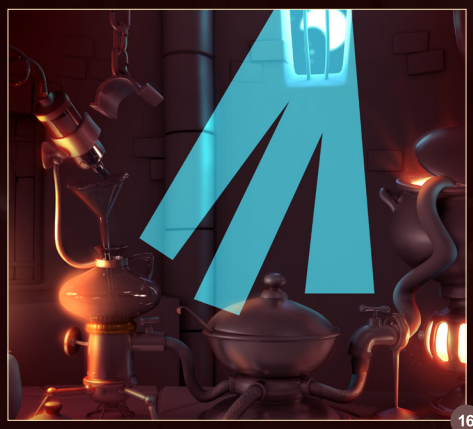
The next step will be to create moonlight and stars for the background. I will also create volumetric light that will come through the window. Since I have an alpha channel I will use it to create a mask for my beauty render.

Sky, moon and stars will be placed in the bottom layer (**Fig.14**).

For the sky I chose a dark blue background. The moon and stars are fairly simple, I created a slightly cartoon version by hand, but photo references are also useful when trying to create a realistic effect. My moon is a simple circle filled with a yellow color, with one circular part deleted. Finally I blurred it a bit and added some outer glow (**Fig.15**).



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The next step, and a very nice detail, was the volumetric light coming from the window. With a simple Polygonal Lasso tool, I created the basic shape of the moonlight, and I filled it with a bluish color. Just as I did for the rim light, I set the blending mode to Linear Dodge (**Fig.16**).

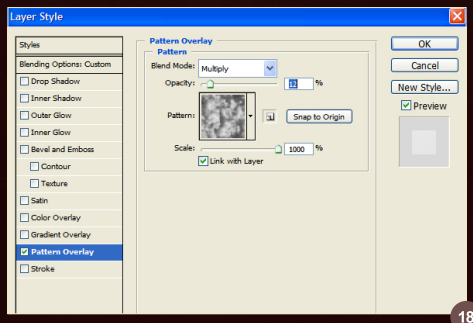
Now I will soften the look and harsh edges with a Blur filter and adjust its opacity. If necessary

there is always the option of painting some more rays, or even erasing some, but it's really the artist's choice (**Fig.17**).

To start with the beam of light seemed fairly uniform and synthetic. What I decided to go was break it up with a pattern overlay effect. For the pattern I chose clouds, with the largest scale option and small opacity, and the blending mode set to Multiply (**Fig.18 – 19**).

To achieve the effect of light decay on the volumetric light I will duplicate the volume light layer, desaturate it and erase all the areas that are far away from the window. The other way


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would be to paint a mask, or to use some photo references; in that case you'll need a black and white image (**Fig.20**).

One final thing to consider about the lighting at this point is the candle light. Wax is naturally a translucent material that dissipates light through the surface. The easiest way to cheat this phenomenon will be to gradually paint light or to use a mask to make it appear like that (**Fig.21**).

I used a soft brush to paint one translucent layer and a specular layer on top of the candles. Specular is much stronger and more prominent,

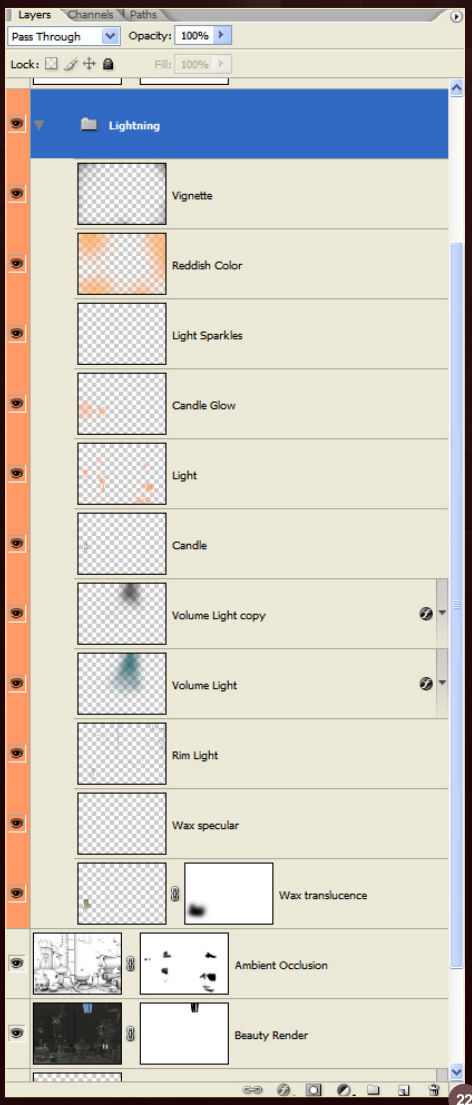
but the translucent effect is actually the one that's more important here and will help sell the illusion.

With this step I finalized the lighting part of the image. I can always come back and change whatever I like, from intensity, to hue, to influence etc, and I probably will be revisiting these layers at the very end. To make it more organized and clean I group all of these layers under a new group named "Lighting" and then moved on to the next section, where we will look at the texturing process (**Fig.22 – 23**).

2D Texturing

Textures are a vital part of any picture, and they play a very important role in our perception of the artwork. In combination with the lighting they define the quality of the surfaces and their properties. Usually in 3D, artists' un-wrap UVs, or use projections to place textures for diffuse, bump, specular displacement etc.

As mentioned before, this scene has no textures at all. What we are about to do is texture an entire scene in 2D and fake most of the attributes. For the most part I will use



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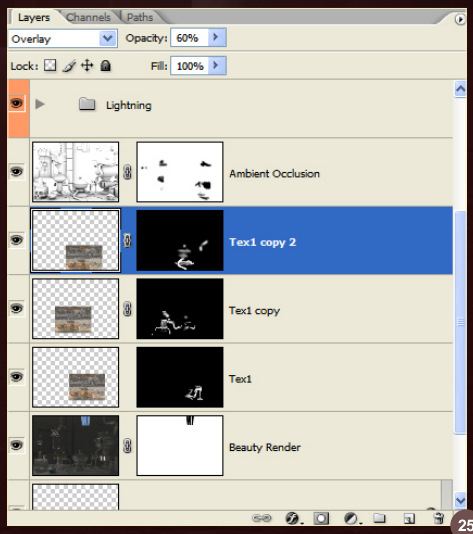

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different types of 2D textures already prepared, cleaned and ready to use in any kind of 3D application, but I will also use some reference photos I shot or found online. Just like in the case of the lighting I will use masks, transform tools and various brushes.

First of all I created a rust effect on various metal pieces in the front, using one of my favorite libraries from 3DTotal's Total Textures V2:R2 – Aged and Stressed DVD. Here's the image that I used (**Fig.24**).


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As you can see there are plenty of fine details here, but I decided to combine it with other images from the same collection. I put it under the Ambient Occlusion layer defined the blending mode as Overlay. With a very soft brush and opacity I painted in parts that I



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needed to be seen. This means that I set the mask as completely black and, with a white color, I revealed just certain portions – this technique is my personal choice.

Since the final resolution was quite large (it's 4K) I planned to duplicate the image several times for different parts, and rotate and scale it accordingly. It was important to imagine how the image would look at the end and to invest some time in telling the story of the image, like there are some parts where some liquid leaked, which


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has created rust etc. Here is the example of how I duplicated and masked different parts of the image and the final result (**Fig.25 – 26**).

I continued to paint this first layer of rust over all the metal parts. Don't forget that here I was just painting a mask of the texture I used for the metal (**Fig.27 – 28**).

As you may have noticed, some nice color variations have been achieved on the surface, but some new layers need to be introduced in order to introduce natural variations and imperfections of different materials. This is a great piece of metal that came from the same library (**Fig.29**).

Here you can see that I even painted some texture over the glass just to eliminate the sterile, clean look of its surface (**Fig.30**).

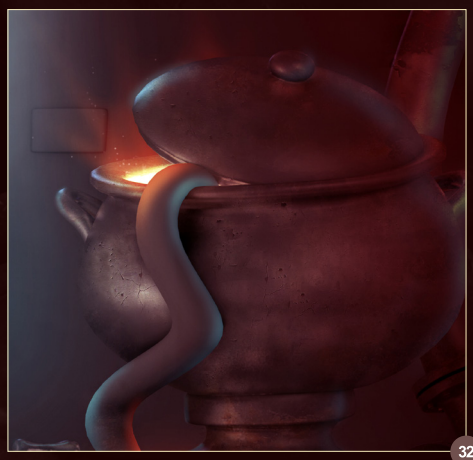

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Finally I added some small marks with this texture (Fig.31). For the blending mode I used Vivid Light, but as I said don't forget to experiment with different modes as this is just an example not a rule. This created the very subtle effect of cracks and marks on the metal surface. I gently placed it over different parts of the image. You can see some beautiful details here. It doesn't look as synthetic anymore (**Fig.32 – 33**).


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To accentuate rusty edges and bumpy surfaces and to give my textures some depth I painted light strokes on the edges of parts where the surface would not be entirely smooth, like the cracks for example. I used a brush with a very small diameter and just followed the path of my lights. I only painted the sides that are directly lit. You can see how much this improves the overall quality. Of course you can improvise when doing this as long as what you end up with looks good (**Fig.34 – 35**).

Also I added some extra layers of texture, but I used just some portions of it. The purpose of these textures was to introduce some more details. You can never get enough of details, especially in computer graphics (**Fig.36 – 37**).

The more layers we introduce, the more details we will achieve. Of course the artist should find the right balance. Here is the example of one more layer above all of the others, and the painted specular on top of it. By this point I had three different textures above each other (**Fig.38**). What's more important is that with every new texture I introduced, I was constantly painting in the specular layer.


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For the cauldron in the middle I found a very neat texture that helped me to sell the illusion that some sort of matter used to drip out of it.


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The funny thing is that this specific texture came from the stone collection, and I just used one portion of it (**Fig.39**).

Here you can see how I just masked that specific part of the texture and I used Warp Transformation to deform it accordingly (**Fig.40**).


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To keep everything organized I grouped all of these textures under a new group that referred to metal textures on the table.

The next step was to texture the table top, which is made from stone pieces. I used this texture for the first layer (**Fig.41**). Gradually I added more. Like the layers used on the metal I set the blending mode to Overlay and used a low level of opacity.

I wanted to add some noise here, so I used Gaussian Blur with minimum strength to soften it a bit, and later I used the Blur tool to soften specific areas. I masked out areas I didn't need with a soft brush. I added to the other stone texture with this one (**Fig.42**).

The one thing we should not forget is the specular details that I put around the corners of the table blocks. Of course there is no perfectly clean desk in the world, especially if it belongs to an alchemist and is situated down in the cellar.

Here, for those details and especially dirt I used a photo I took recently. I used ground details such as leaves and small stones. When you work on some sort of a street scene you can use these kinds of pictures to put leaves and other dirt in the corners and it will look very convincing (**Fig.43**).

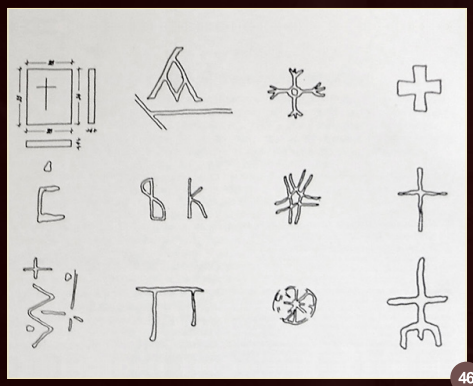
I put this layer at the top and masked out a lot. I just left what I found interesting. Here is the final look of the table top; it's all mixed and you cannot really tell that I used one specific texture to accomplish this task (**Fig.44**).

The skull is textured using the same procedure. For the texture I used this one from the stones collection (**Fig.45**).


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Now for the bottles on the table; they don't have any specific color information, or texture. First I painted in some color, with the blending mode set to Color. To avoid a uniform color feel I always erase some areas, but for that I use a very soft brush with a very low level of opacity. Finally if the color is too intensive, I use the Sponge tool and saturate it. You could also use a Hue/Saturation window to control the overall level of saturation with the sliders.

Now I have some papers in front of the oven; they are some sort of alchemist formula. To make it a bit interesting I found this image in an architecture book. These marks were found on some ancient bricks and they looked kind of interesting. I retouched the image and put it on top of the paper. Using the Distort Transform tool I adjusted its shape to match the papers (**Fig.46**).


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To accentuate the marks I painted specular strokes on top of it, and some dirt with a simple black color set to a low opacity. I used the same method for the big hose coming from the big cauldron. It consists of several layers for basic color, two mixed textures, and specular (**Fig.47**).

By this point I was almost finished with the front layer of the image. The final touch was to add liquid to the bottles. I painted them just like the other parts, but you could always shoot a real photograph and combine it with your render.


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The first thing would be to give it some color, and I chose a light green. I didn't change the blending mode here; instead I left it as it was. Here I painted several layers with one being a sold liquid layer with some bubbles and splashes on top of it. I used a variation of the same color from light to dark.

The next one had a lower opacity, but the same color, with small drops and traces of the fluid that is moving within the bottle. On the specular layer I painted a specular reflection for the bubbles and for the candle light. I used the same color for the specular as for the liquid, so that it's not white but green. Finally I introduced some reflections on the glass surface, mainly for the candle and a flame. You can see the progress here (**Fig.48**).

The same principle was applied for the left bottle with the red liquid in it (**Fig.49**).

With this step I finished the front layer of the image, and I will finish the background using the same methods. The background has fewer elements and will consume less time. At the end I'll re-examine the entire image and redo the parts that need correction.

I started with the door. Doors are mostly made of wood, but they have some metal parts on


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them as well. For the wooden planks I used one of the textures from the wood collection that I retouched so it didn't have visible plank edges, and it looked seamless. I did this because my model already has modeled planks (**Fig.50**). I used this same texture for the horizontal and vertical parts, just rotating it accordingly.

For the metal parts I used this texture, but slightly desaturated (**Fig.51**).

Finally my door looked like this. I masked out everything I didn't need (**Fig.52**).

For the large column next to the window I decided to use a marble texture. So I didn't combine it with any other image as it looked just fine the way it was. I also painted some specular light around the cracks to mimic a bump effect. The wall, on the other hand, was quite large and needed some extra work. For the basic texture I used this one, with the blending mode set as Overlay (**Fig.53**). I duplicated it until it covered the entire back wall.

To mimic the decreasing intensity of the light as it moves away from the window, and in order to achieve some darker parts in the image, I used one layer style in an extra layer. I used a Gradient Overlay with default black and white colors and Multiply as the blending mode. I also put a completely black layer set to Multiply mode with a very low level of opacity on top. After that I masked out areas that were not dark. With this effect I faked light falloff coming from the window.

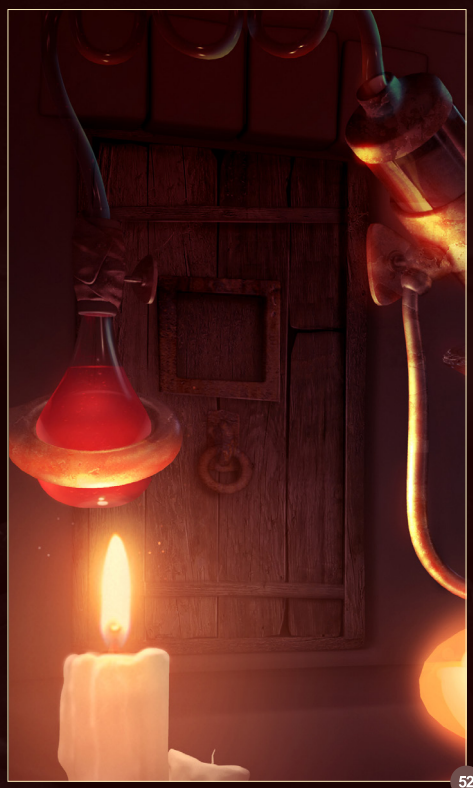
We are now almost about to finish the texturing process of the alchemist chamber. Just like all the other parts in the image, I textured the remaining parts, such as the bricks and the staircase in the lower right corner.

In order to keep everything organized and clean I grouped all of these textures under a new group and I named it accordingly. It is much easier to keep everything organized from the beginning because it can get messy very quickly. This way anyone can troubleshoot what you did, and also you can navigate much faster through sometimes thousands of layers.

Painting over details

With the image almost finished, it was time to paint over some of the fine details, like the spider-webs or smoke coming out of the cauldron. Considering spider-webs, I usually paint several layers.

The first layer represents the overall design of the spider web. I will paint it with a harder brush in order to visualize how it looks. But keep in mind to never use a brush that is too hard, because it's a bit tricky to control, especially on





high res images. After this step, I will soften it with a very soft brush, and also lower the layer's opacity. Often I paint more details after this step over the top.

Finally I add one more layer with very fine strands, and I also add some very nice specular highlights on the web. As I mentioned before if you have a real-life image then don't be afraid to use it; I chose to paint it in order to show a technique and also because I enjoy drawing. Here is the web I drew around the window. I also did several of them in other parts of the room (**Fig.54**).



54

Concerning the smoke coming out of the cauldrons, I painted some parts, and for the others I used images that I found from a reference library online. When I paint smoke I usually use very soft brushes. For the volumetric shadow I usually use the Burn tool as well as Dodge tool for the highlights.

For a photo reference I deliberately chose a smoke shot in front of a black background. When the background is black, and the smoke is white, we can set the layer mode to Screen and only the smoke part will remain. Then I can easily mask its falloff and it will look perfect.

All that remained was some fine-tuning, including effects like depth of field and glow etc., and the image was complete (**Fig.55**).

We've come a long way with the image, but you can always refine more and more and introduce new layers as well. Just let your imagination and inspiration guide you. Never be afraid to experiment and try out different things; the more you practice, the more you will discover.

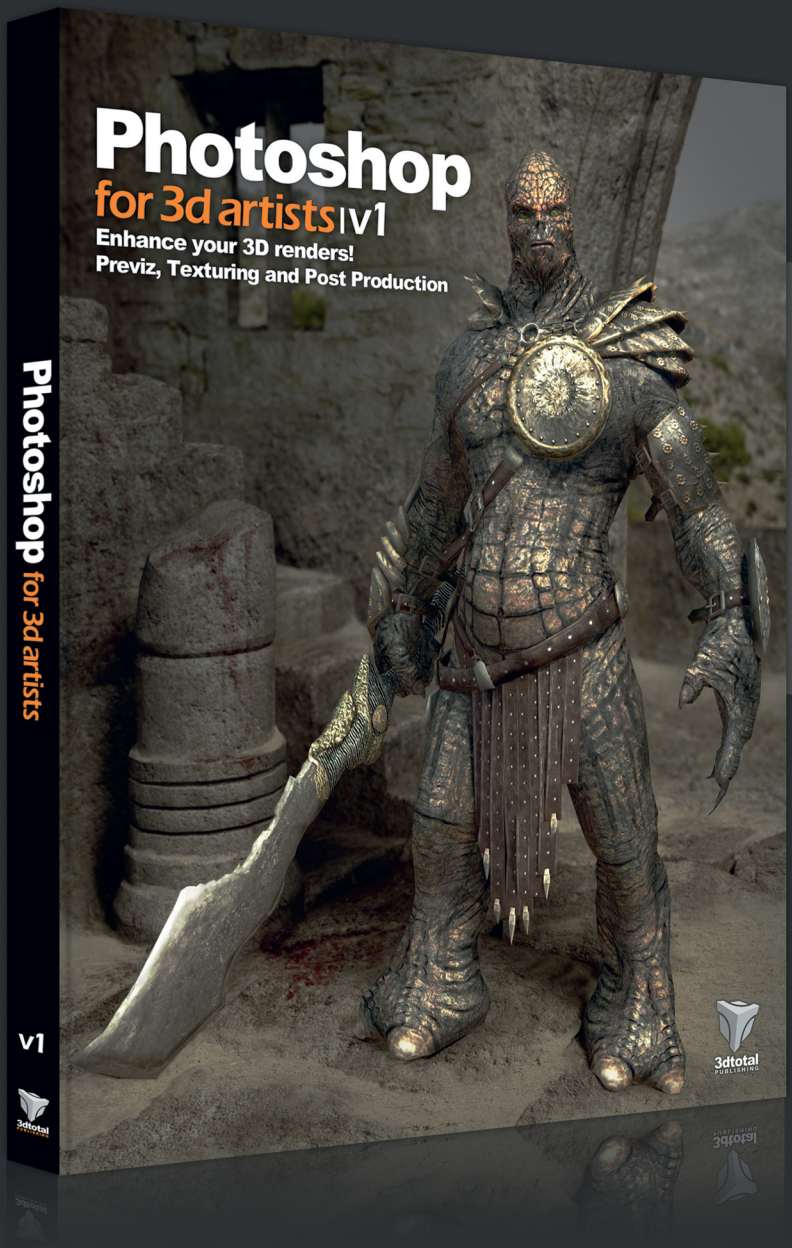
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Photoshop for 3d artists | v1

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A comprehensive Photoshop guide exclusively for 3D artists covering key stages in the pipeline, including pre-visualization, texturing and post-production.

- Written by professionals who share the latest cutting edge techniques
- Step-by-step tutorials, highlighted tips and tricks included
- Additional links to free downloadable content such as custom brushes and scene files
- An excellent learning tool to accompany 3D design classes.



The tutorials in ***Photoshop for 3D Artists: Volume 1*** cover a variety of different subjects, from the initial concept stage through to post-production. Pre-viz and concepts are explored, showing the advantages of using Photoshop to plan and visualize projects. Combining library images in Photoshop to create custom textures is also featured, as well as how Photoshop can be used as an efficient alternative to lengthy render tests by focusing on compositing passes, adding particle effects, improving light and color adjustments. These post-production techniques are becoming increasingly popular within the industry as Photoshop becomes a more powerful and time-saving tool, enabling almost every 3D artist to enhance their final renders.

With the expertise of the individual contributors, the clearly written tutorials and work-in-progress images, ***Photoshop for 3D Artists: Volume 1*** is a timeless resource for veteran and beginner artists alike.

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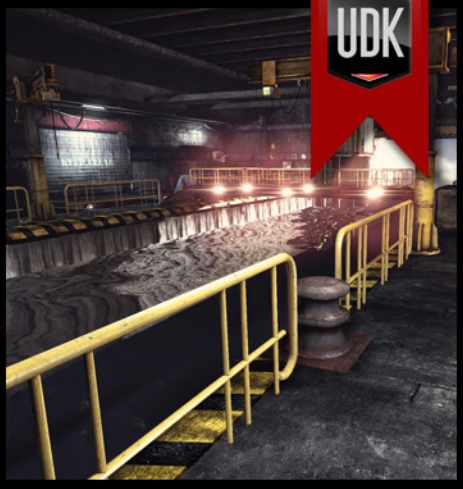
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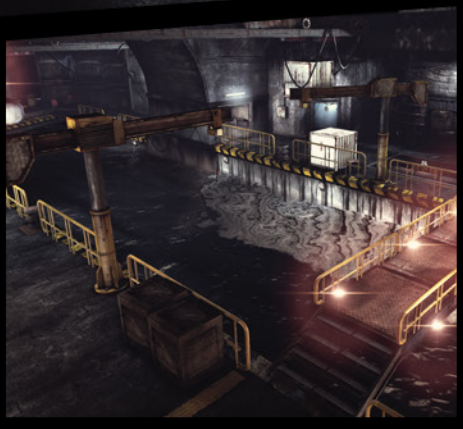


In the modern world so many things seem to become popular and then disappear just as quickly as they arrived, however the games industry has proven itself to be ever present and continues to develop and thrive. For any CG artist the games industry continues to be the most obvious and abundant form of employment, but taking the step from a modeler to creating a games level at a professional standard is no easy task. In this series of tutorials industry professional Andrew Finch will be talking you through how to make a very cool playable games level using the Unreal Development Kit. Whether you are looking to create a cool portfolio piece or just looking for a fun project to try, this tutorial series is perfect for you.









THE SUBMARINE PEN

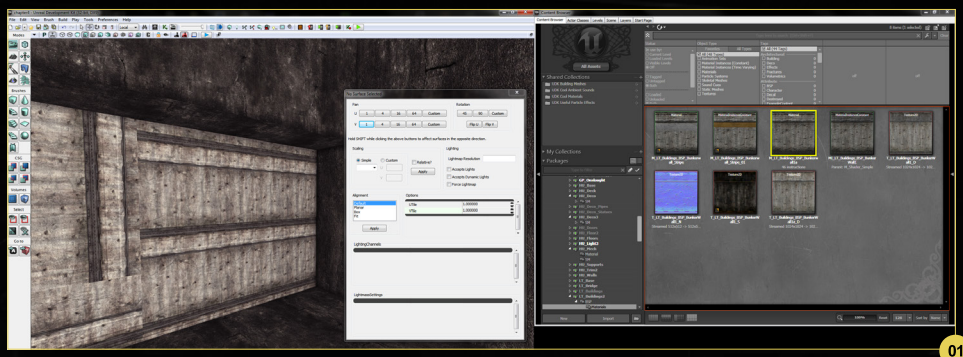
CHAPTER 04 - FINALIZING THE ENVIRONMENT

CHAPTER 04 – FINALIZING THE ENVIRONMENT

Software used: UDK, 3ds Max and Photoshop

Welcome to the fourth part of my tutorial series in which I'm guiding you through the creation of an environment built in the games engine UDK, from the concept to the completion. This is an intermediate level tutorial and you should have at least basic knowledge of the software used. This tutorial is about the bigger picture of creating an environment; I won't be focusing on creating an amazing asset, instead I will be giving an overview of the process of creating the whole environment.

In the last chapter we placed temporary materials on the walls and floors to give us an idea of what the finished environment might look like. It is now time for us to place the final materials and correctly UV map them to the surface of the BSP geometry. Remember this is just the start of our layering process; we will build up on this layer by layer, adding objects and decals to finish off the environment. To make this process quicker I will use already existing materials and objects in this chapter, but I encourage you to create your own textures, materials and objects for your portfolio piece.

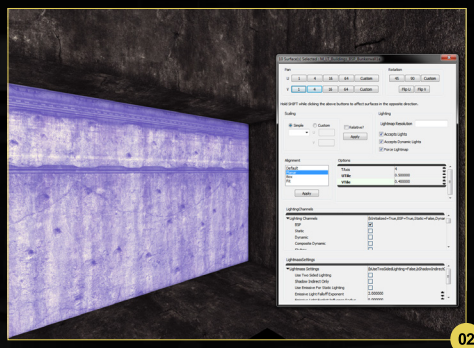


01

There are only two different materials I used for the entire BSP geometry: a dark one that tiled in any direction and a lighter one that only tiled in one direction to add contrast. I used the lighter material for some of the walls, because it also had some trim details to help break up the repetition and add some interest to the plain areas where objects aren't placed.

Fig.01 shows the lighter material applied to the BSP geometry, called "M_LT_Buildings_BSP_Bunkerwall1a"; as you can see the UV is not correct. If you double-click on the surface of the wall it will bring up the surface properties window. This window allows us to correct the UVs and correctly align the texture to the position we want it in.

We do this by selecting the entire surface we want to affect, so in this case I selected



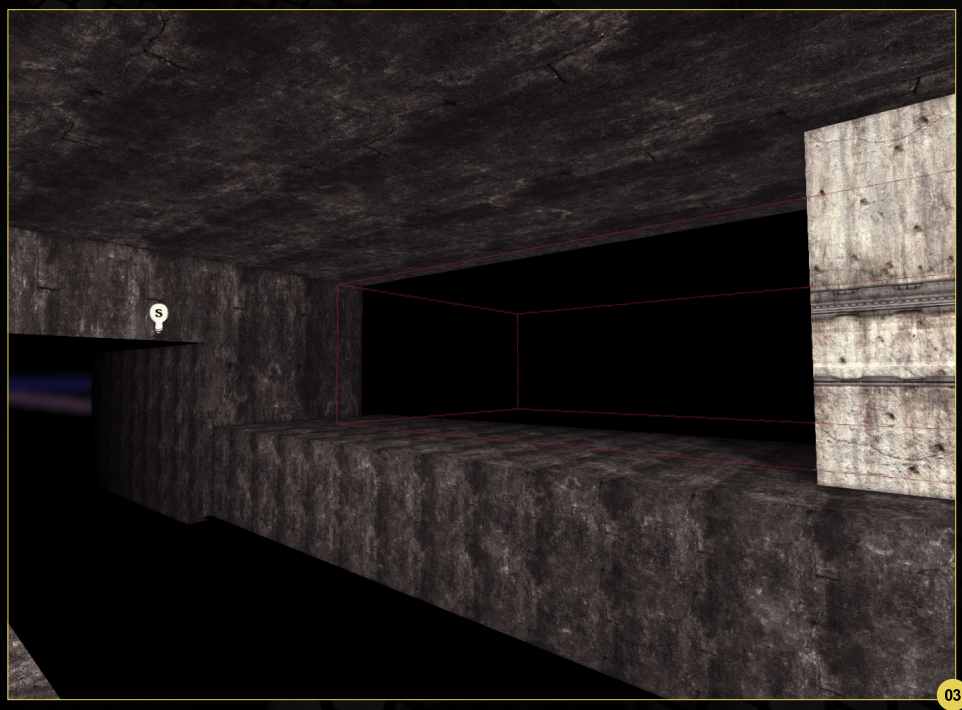
02

the whole of the wall, as I wanted it to match perfectly all the way along. I selected Planar from the alignment and hit Apply. The texture will look like it is scaled wrong, so I then edit the UTile and VTile settings until I get the correct scale of the texture for the size of wall.

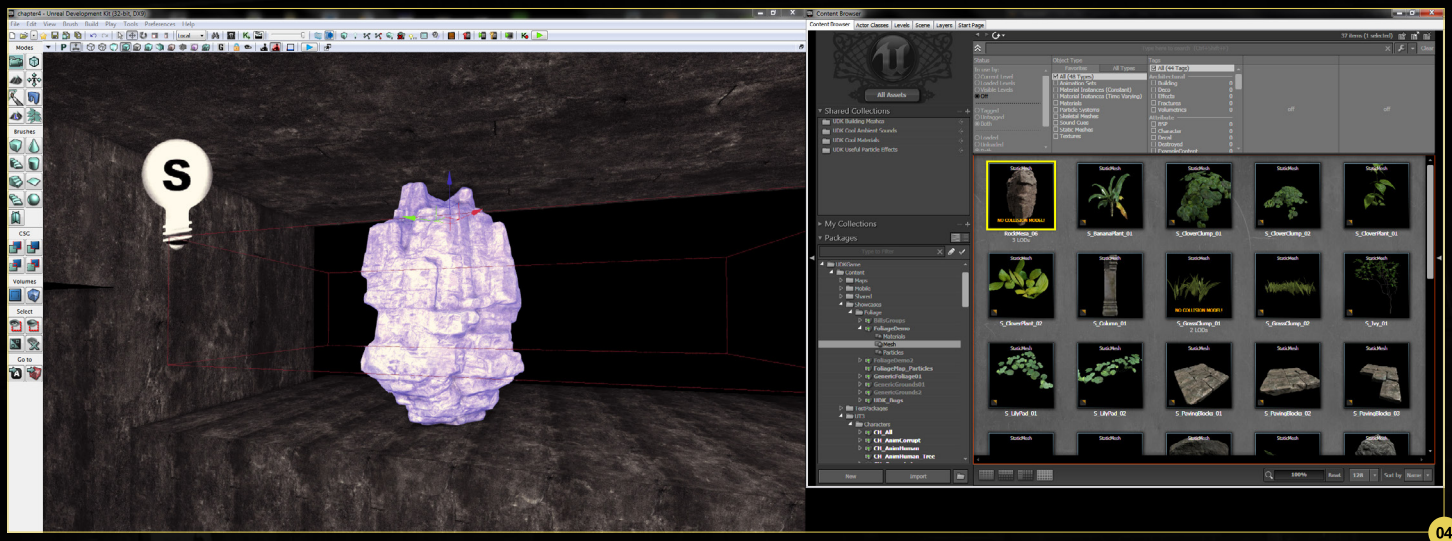
Now the texture is scaled correctly it still isn't aligned how we want it, so using the Pan tools we can scroll the texture up and down until the texture is in the correct position. All the settings I used can be seen in the image and the finished UVs are also visible. The trim runs along the top of the surface, so it looks like it joins in some way to the connecting geometry.

I did this for all the remaining surfaces and the darker materials until I was happy with the way the environment was UV-ed. **Fig.02** shows a completed area and you can also see another completed area with the darker material applied in **Fig.03**.

As you can see in this image there is a huge hole in the environment on the right-hand side; this has been done on purpose, as I wanted this wall to be made of rocks to give the impression of the submarine pen being built into a cave of some sort.



03



04

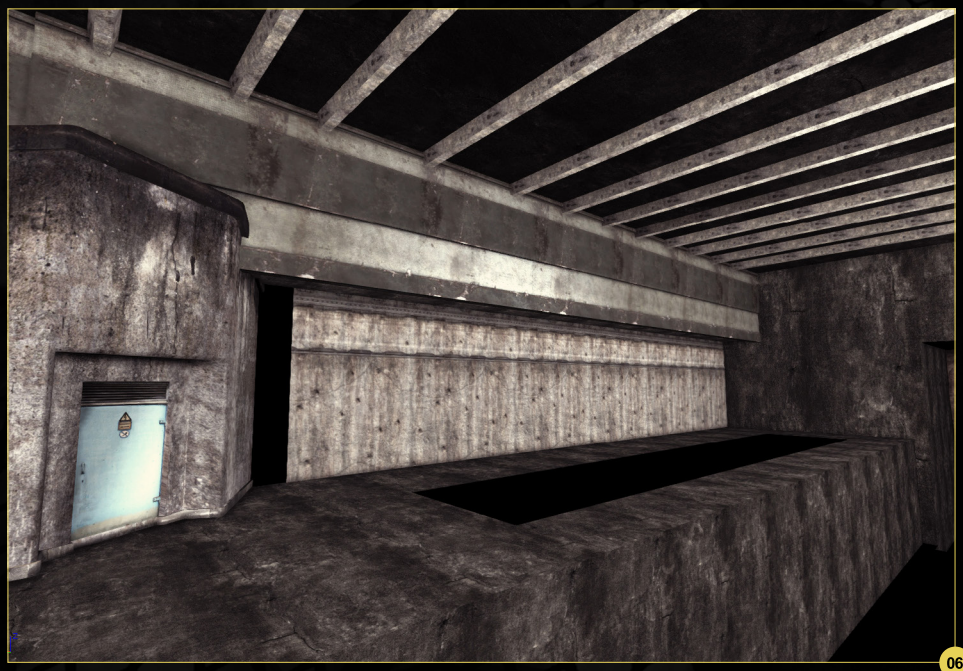
Fig.04 shows the already existing asset in UDK called “RockMesa_06” placed in the level ready to be scaled and maneuvered into position.

In **Fig.05** you can see the finished positions of the rocks; I also thought it would be a good idea to place these rocks in the entrance to the submarine pen, to further give the illusion of there being a rocky cliff outside of it.



05

In order to start adding more interest to the walls and break it up a bit, I decided to use a wall static mesh called “S_HU_Walls_SM_Flat”. This was a good mesh to use because it was in contrast to the rest of the walls, the material was metallic and we can use this to our advantage when lighting, because the specular will catch the highlights and give us some nice visual effects. **Fig.06** shows multiple wall objects placed horizontally across the top wall. I also continued to use this object throughout the environment, as seen here in **Fig.07 – 08**.



06

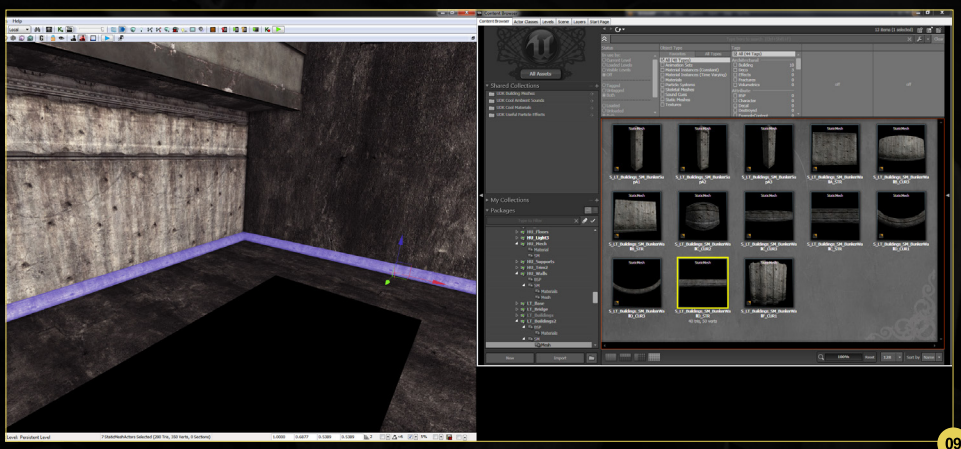


07



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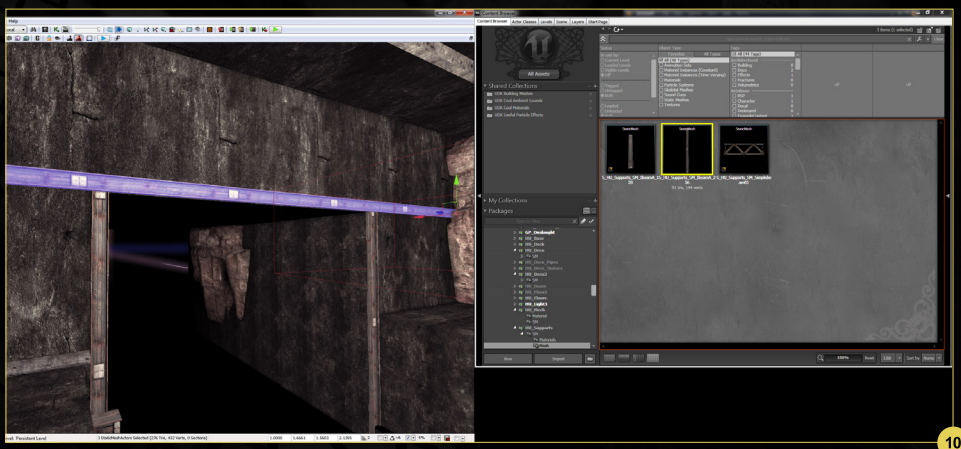
A common problem in the games art world is making objects sit together particularly well where walls meet floors. So here in **Fig.09** I have added a skirting object around the outskirts of all the walls that meet the floors. It just helps to gel the world together and make it more believable.



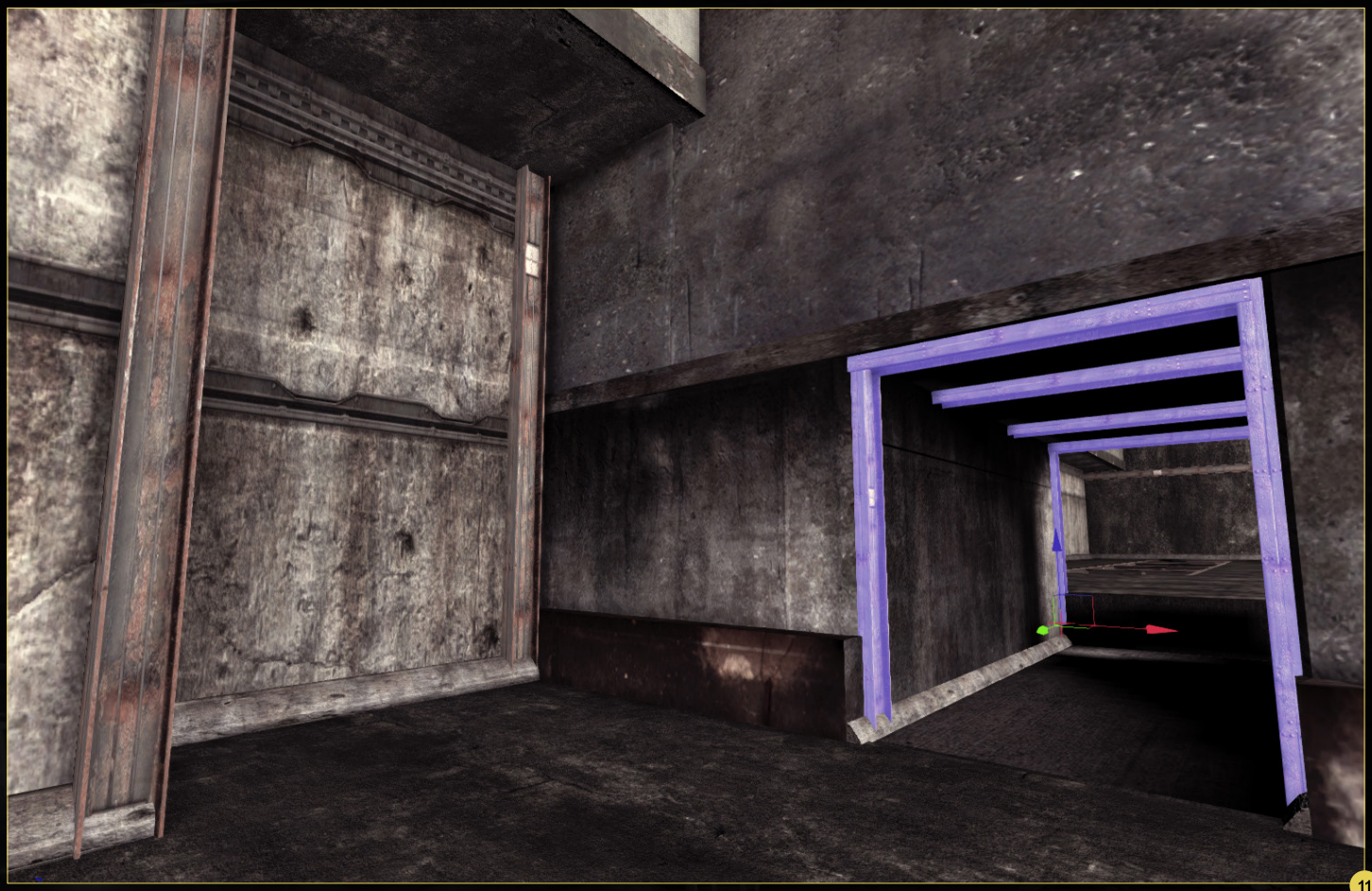
09

I started to add support columns or girders to the scene, I placed them along the edges of walls to give the illusion of creating a support structure to hold the walls up. It's a good idea to think about how the buildings are constructed in real life, as it will help us create a realistic world and add points of interest to break up the environment.

Fig.10 – 12 show how I arranged the support beams. I also added them going across the sub pen from one side to the other. This was so I could add cranes running along them later on; again adding to the believability that this is a real life working environment.



10

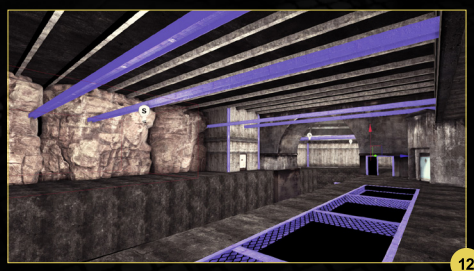


11

I also thought it would be a good idea to add a wire-meshed fence along the rocky wall; this will give us plenty of options later on to add some areas of interest, such as multiple layers of objects and interesting lighting placement. **Fig.13** shows the line of fences placed in the environment.

So this concludes the placement of already made objects in the UDK library. You should search through the library and find suitable objects to populate your scene with.

Fig.14 – 15 show the final stage of this chapter with all the existing assets placed. If you are doing this as a portfolio piece then I would say not to use any objects from the library and only use your own assets, that way when you show potential employers your work it will be 100% your own work. I will cover this process in more detail in the next chapter.



12



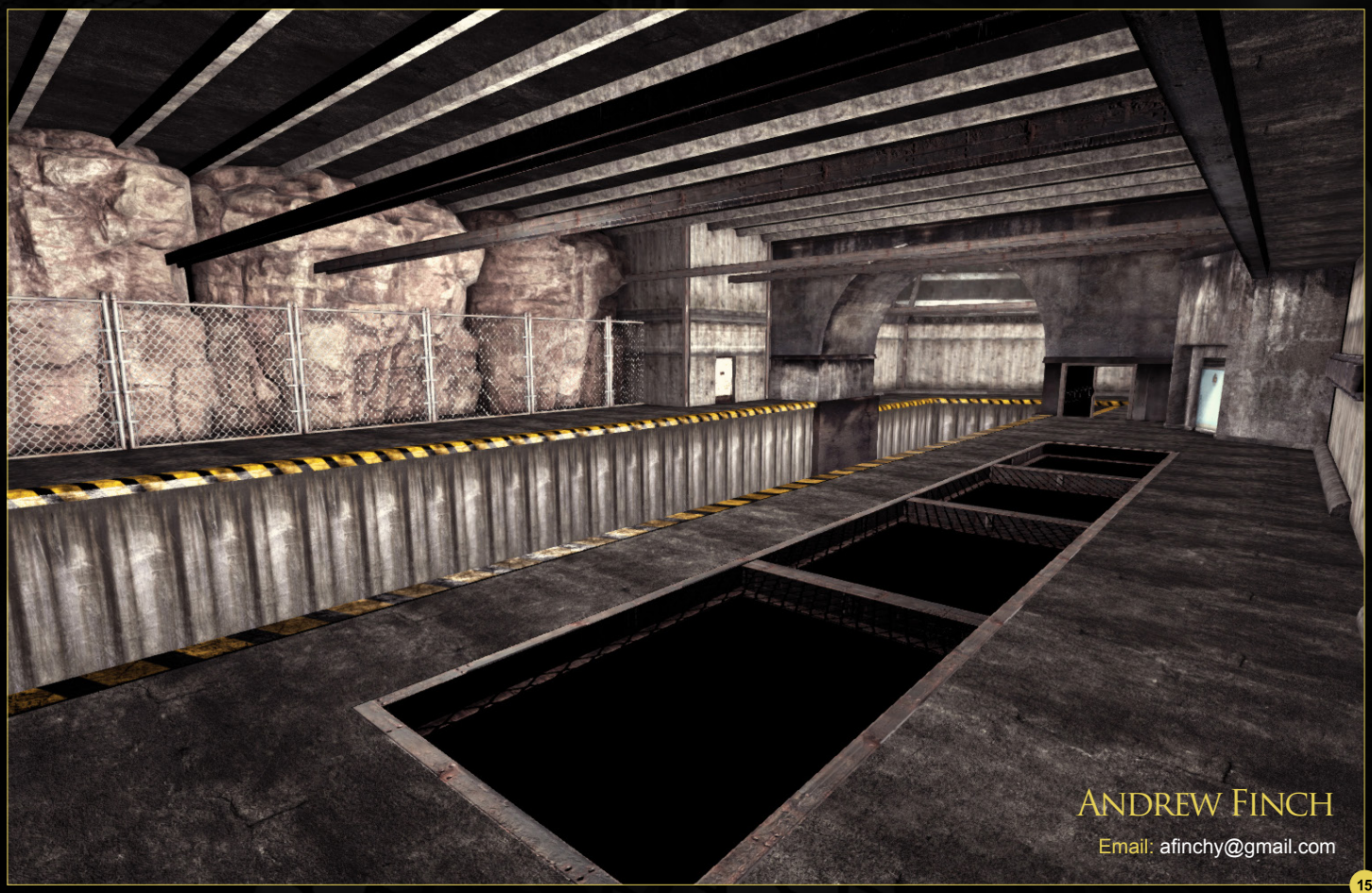
13

Using already made assets is also good because you can quickly see if a composition will work correctly, before you spend a lot of time creating artwork that may never get used.

Until the next chapter keep playing around with placement, generating ideas and creating your own art assets to be placed in the environment. Thanks for reading.



14



ANDREW FINCH
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15

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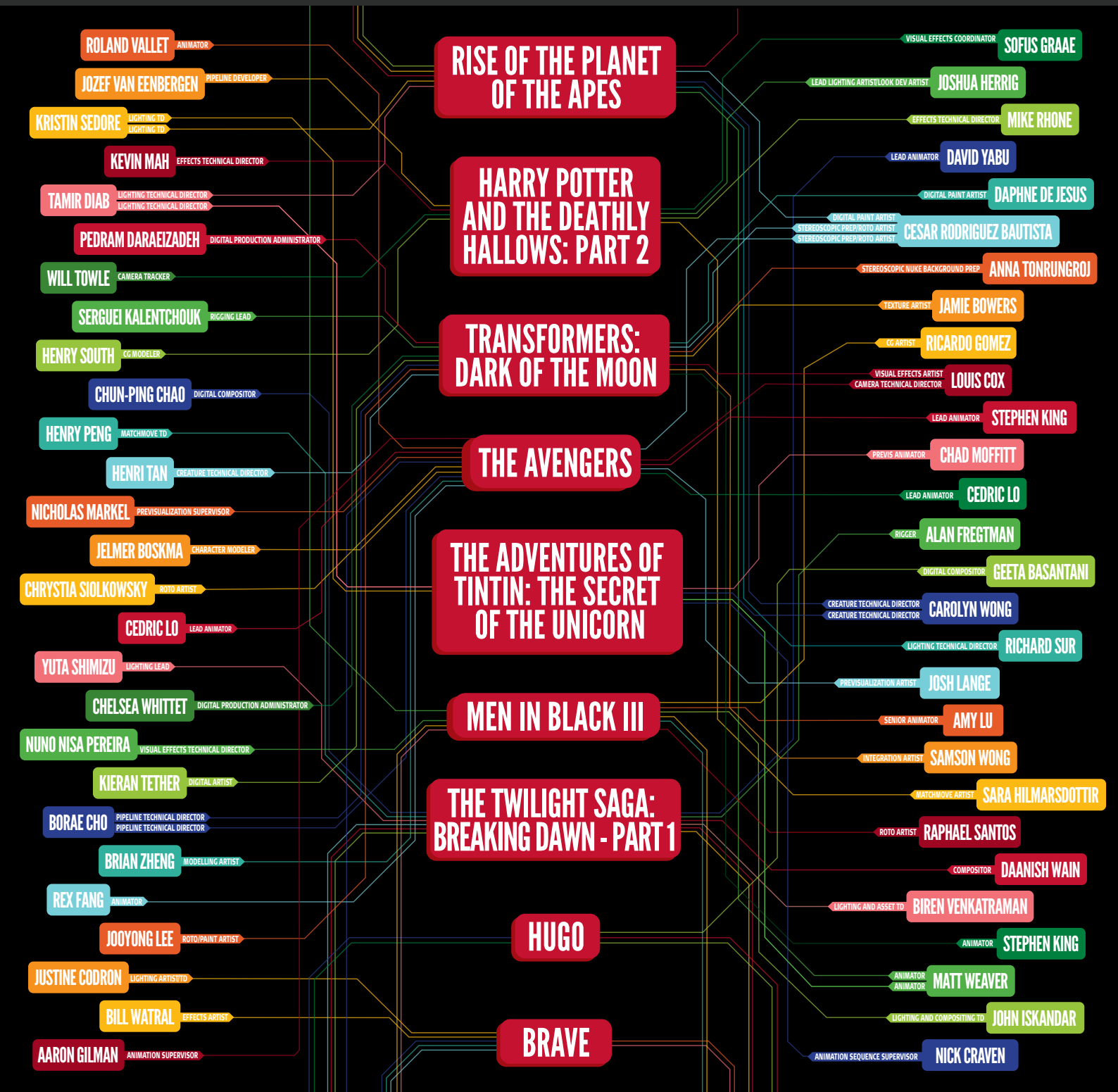
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ZBRUSH QUADRAPEDS

ZBrush is a formidable piece of software that is capable of so much. The possibilities are endless and the only restriction is your imagination. In this series our brilliant artists have been given complete creative freedom to show us how to create the organic forms of their quadrapeds. They will cover everything from concept through to final illustration and will show us how to create some brilliantly imaginative quadrapeds!

Chapter 01

Software used: ZBrush 4R3

Introduction

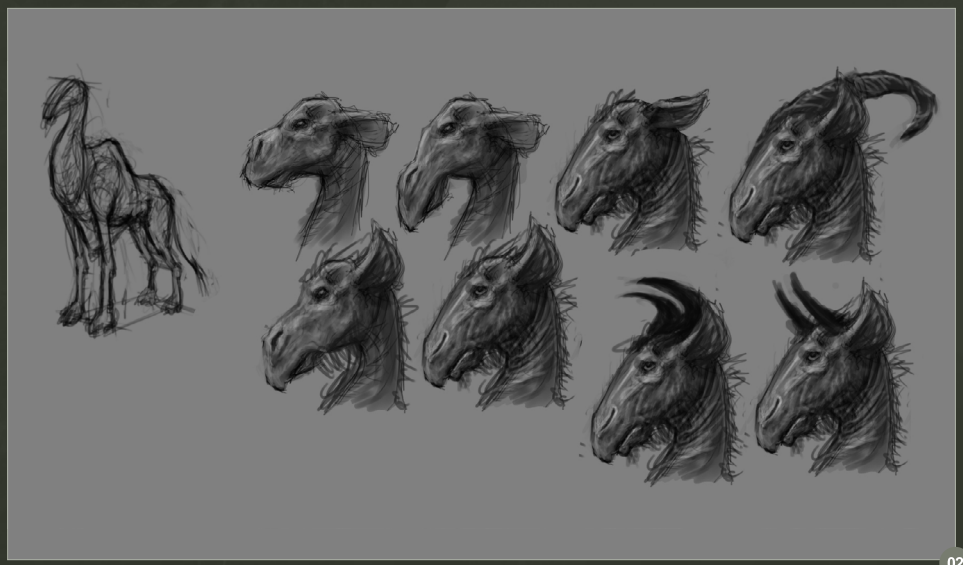
When I got contacted by *3DCreative* I was really excited about the idea of making a quadraped. I thought it would be a great opportunity to show people the versatility and the creative workflow of ZBrush. In the beginning of the modeling process I use separate geometry islands for the different pieces of the body. This is a workflow that I think resembles the thought process of roughing out a character in 2D. There is a lot of ground to cover so let's get started!

2D Concept

At first I only knew that I wanted to create a fantasy quadraped. I didn't know which direction to go in, so I sat down and drew some ideas in the form of thumbnails and rough sketches. It's fun to concept and speed-model ideas inside of ZBrush, but I think the ideas usually transform into a sketch faster with a 2D medium (**Fig.01**).


01

After this I tried to analyze the sketches and find a form that I liked. I decided that I didn't want to go for the typical ZBrush monster, but rather a slender type of desert creature. I imagined that it should be used for traveling by a fantasy race of nomads living in the desert. I felt that I wanted to develop the creature a bit further in 2D before jumping into ZBrush, so I started designing the head (**Fig.02**).

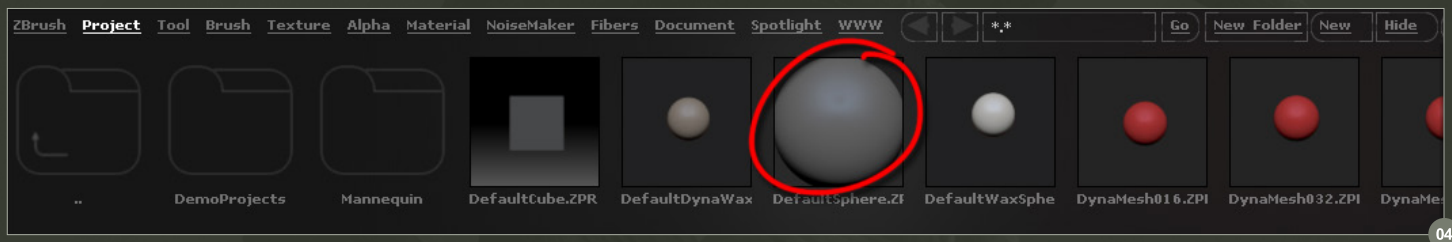

02

After doing some design variations of the head, I decided to go for one where the horns followed the curve of the head. Now it was time to refine the creature's body and add some props. I wasn't sure how many props I wanted to add, so I did three versions. I sketched one creature without props, which would serve as a reference for modeling the body, and two others with a different amount of props on (**Fig.03**).


03

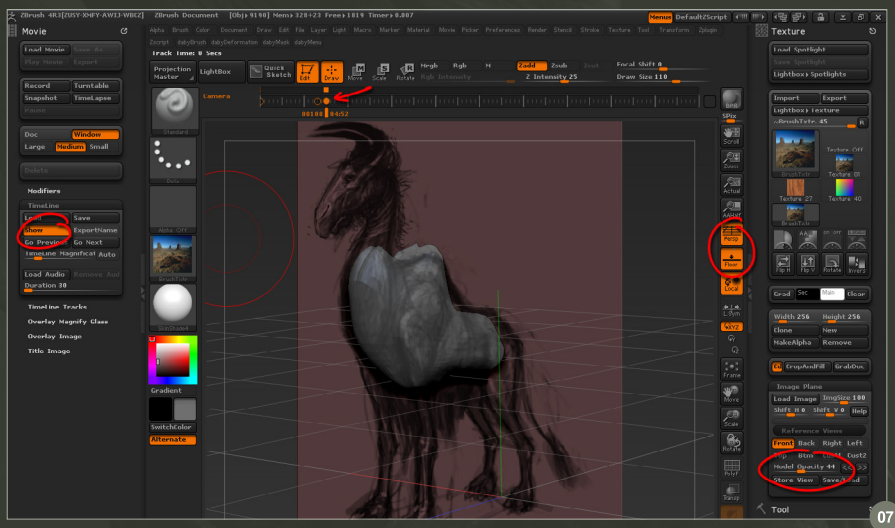
Base Mesh Creation

When I sculpt I usually ignore topology for as long as I can. This gives you freedom to try out











different ideas without worrying about messing up edge loops, which usually is the case when you start pushing and pulling your mesh a lot. The correct animation topology can always be done later. If you work in production you can easily split up your model as a proxy for the rigging department and hand in a better topology for skinning later on.

There are lots of great ways to create a base mesh in ZBrush; ZSpheres is one, but I want to try something I haven't done that much of for this tutorial. The workflow I want to try is to create the different parts of the character as separate geometrical islands and therefore have greater freedom to push, pull and move around in the beginning of creating the creature. The plan is to do this with the CurveTubes brush and later convert it to a DynaMesh. Let's get started!

Begin with the default sphere from the lightbox to have a starting point, which is demonstrated in **Fig.04**.

Then load the reference image into the document (Texture > Image Plane > Load Image) (**Fig.05**).

It's good to save the document at this point, so you always have the same position of the image plane. If you were to accidentally drop something on the document or mess it up somehow, you can always load the original back into ZBrush (**Fig.06**).

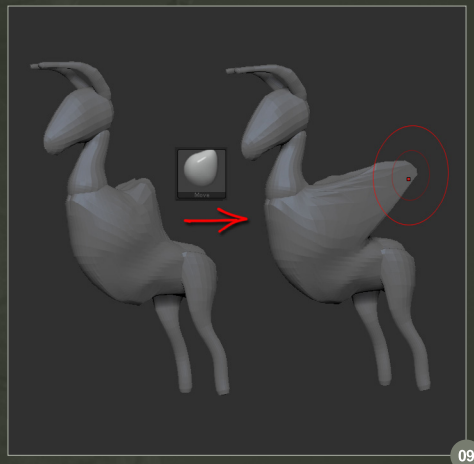
Go to the lowest subdivision of the default sphere (Tool > Geometry > SDiv or press hotkey D to step down in subdivisions). Then delete the higher subdivisions (Tool > Geometry > Del Lower). Lower the opacity on your model (Texture > Image Plane > Model Opacity) and turn on Perspective and Floor on the right-hand side of the document.

Try lining up the viewport with the sketch. Once you have a decent view you can store the camera position in the timeline. Open the timeline (Movie > Timeline > Show) and set a keyframe by left-clicking on the timeline. Existing keyframes can be deleted by dragging them from the timeline. You can use the left and right arrow keys to step between key frames (**Fig.07**).

You can rotate the camera around, but if you still want to keep the image plane with the reference in the background you might want to use the Zoom and Pan Document buttons on the right-hand side of the document (**Fig.08**).

Continue to move and sculpt the model. The different brushes can be selected by pressing the hotkey B. Please note that all brushes have a letter attached to them. Press this letter on the keyboard to filter out the brushes. You can also learn the hotkey sequence for the brushes that you usually work with, for example Move is B + M + V.

In this phase of the modeling process I usually use the following brushes and tools, then move



the mesh around; by holding the Alt key the mesh moves in the normal direction sampled by the brush (**Fig.09**).

Use a standard brush; it's pretty soft. It's nice to build up volume with a low Z intensity (hotkey U). Holding down Alt pushes the mesh inside (**Fig.10**).

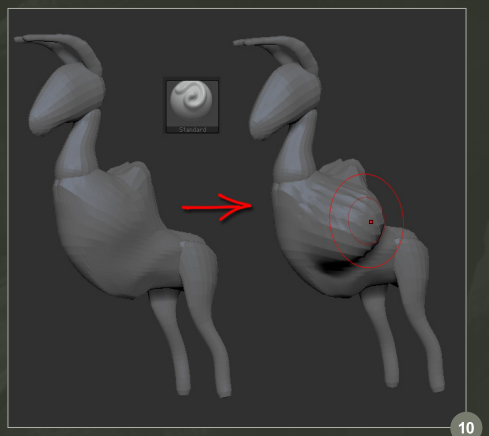
The TrimDynamic brush flattens the mesh. The brush follows the surface of the existing mesh (**Fig.11**).

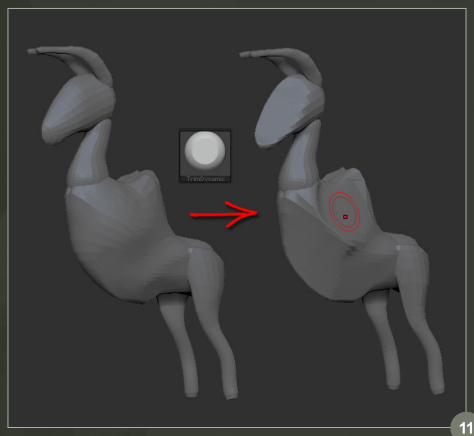
The CurveTubes brush inserts a tube into the mesh. The bigger the brush you have, the fewer spans the created curve has. The size radius of the tube can be set by adjusting the size of the brush when it's outside of the created curve (red circle) and then clicking on the curve (blue circle).

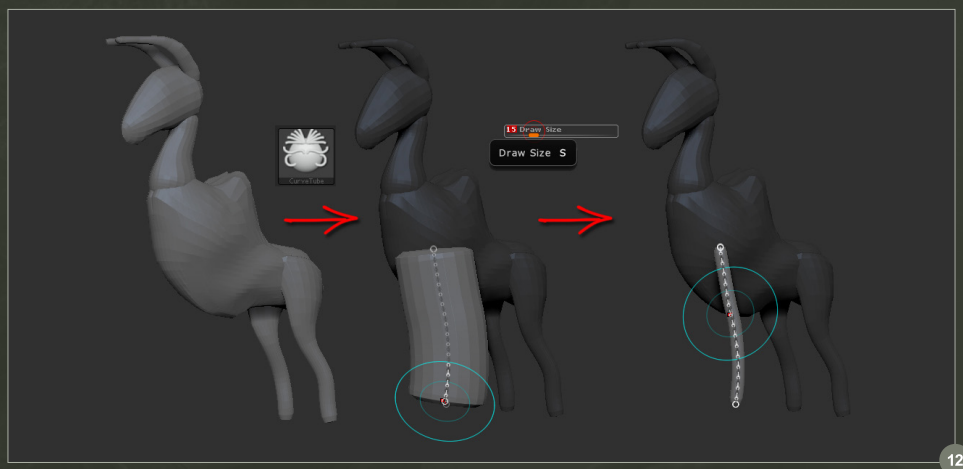
The curve can be adjusted by dragging the points of the curve. Only one curve can exist on the model. When you create a new one the old one is deleted, but the created mesh is still there. You can also delete the last created curve by left -licking on the mesh when the brush circle is red. It is only possible to use this brush when the model has one subdivision (**Fig.12**).

The ClipCurve brush pushes the faces along the curve. This is a good tool for cutting into the mesh and establishing a profile (**Fig.13**).

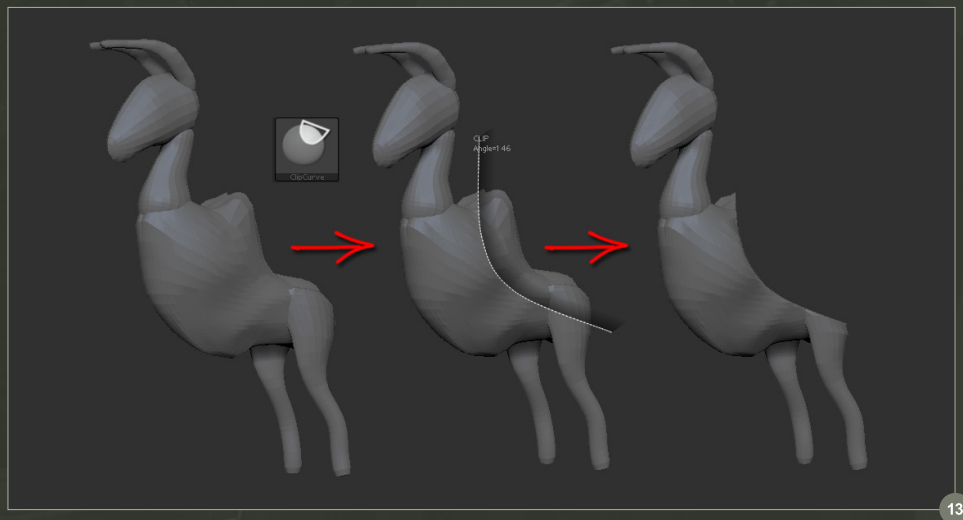

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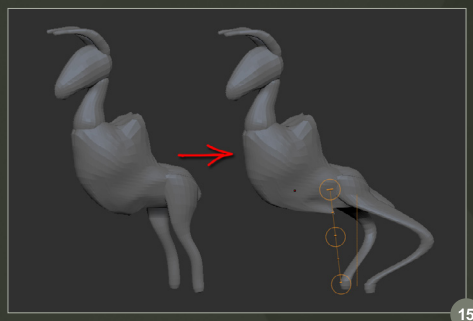
Mask Pen

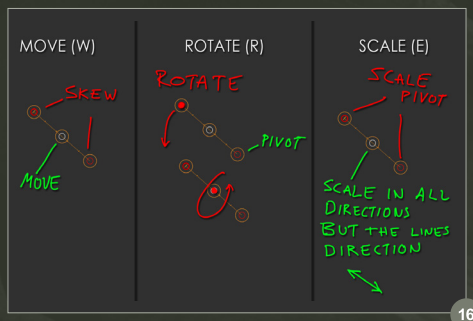
By holding down Ctrl you can mask the surface of a model. You are unable to affect the masked area with another brush. The mask can be inverted by Ctrl + clicking the document outside of the model (**Fig.14**).

Transpose Line

Enter this tool in three different modes: W for Move, E for Scale and R for Rotate. First you draw a line and then you choose a point on the line to use. You can also use masking with the Transpose Line functions by holding Alt and dragging the point. This is a tool that takes a while to get used to.

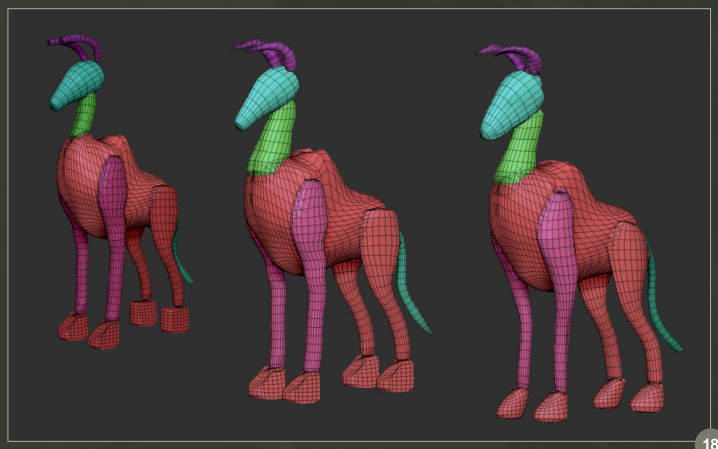
You can also mask the model by topology with the Transpose Line tool. Hold Ctrl and drag it on the model to access this feature. You can also mask all but the polygroup that you click on.

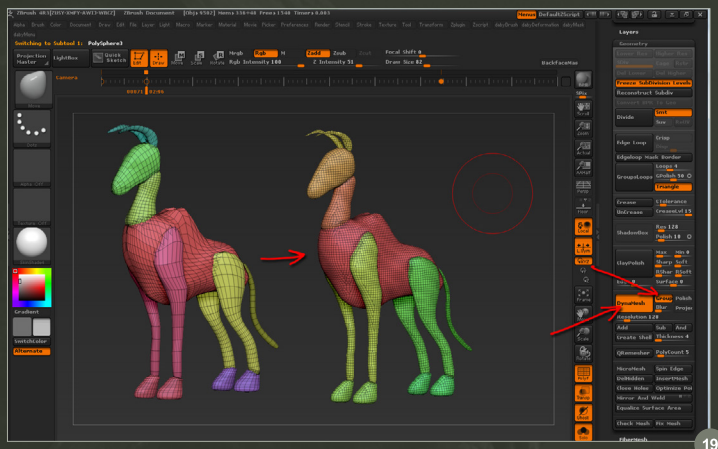

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Hold Ctrl and click on the model to mask all but the polygroup that you clicked on (**Fig.15 – 16**).

Use the CurveTubes brush to build up a basemesh in steps. You can use Mirror and Weld (Tool > Geometry > Mirror and Weld) to create a perfectly symmetrical basemesh. Once you have a symmetrical mesh you can use Tool > Deformation > Smart ReSym to make the model symmetrical shape-wise (**Fig.17**).

Using the different brushes and tools, continue to refine the model. If you wish, you can turn on Polyframe with the shortcut Shift + F (**Fig.18**).

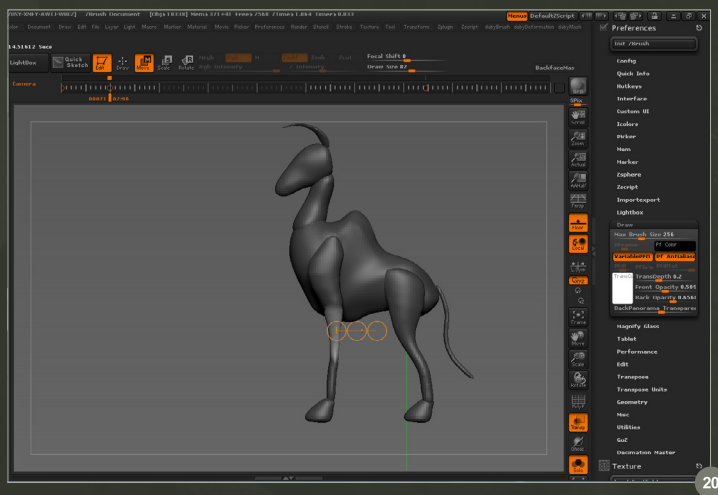
General Forms

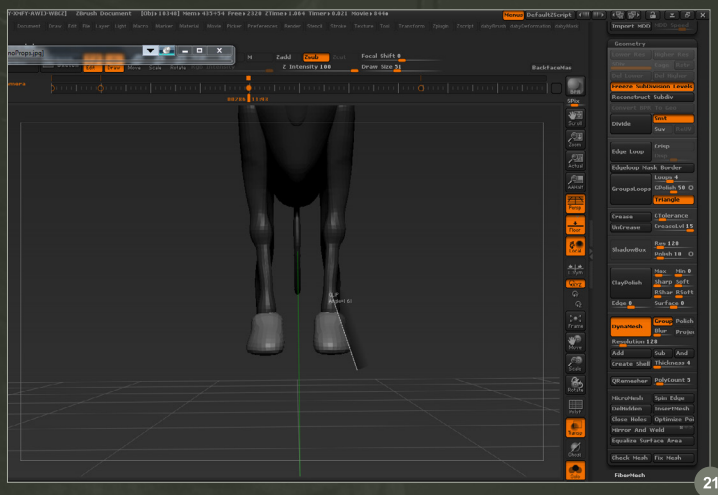
Since there is an uneven distribution of polygons that are unsuitable for sculpting, we will convert the geometry to DynaMesh. By activating the Tool > Geometry > DynaMesh > Groups button we will keep the different geometric islands separate from each other (**Fig.19**).

Don't forget to use masking and transpose when moving or scaling different parts of the body. Also remember to mask all polygroups with transpose and Ctrl + click on the polygroup (**Fig.20**).

Use clipping brushes to model big forms. To avoid unwanted clipping when using the Clip brush that's facing inside of the model, you must mask off one side. Then apply the clipping on the other side with Tool > Deformation > Smart ReSym (don't forget to mask the side that should not be affected by re-symmetry). You can also use Mirror and Weld if your mesh only has one subdivision (**Fig.21**).

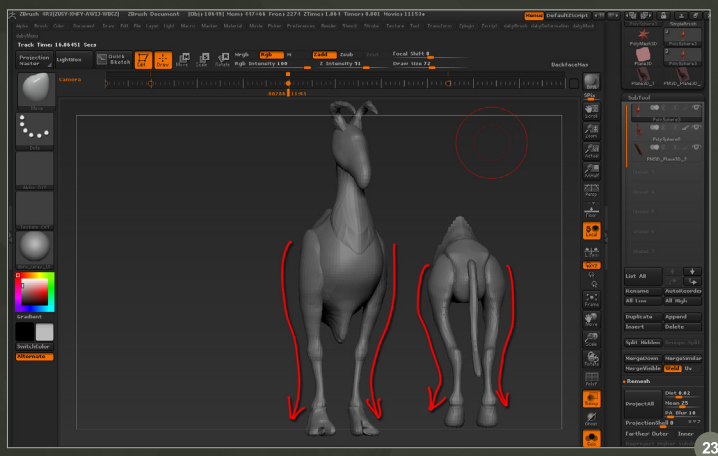
Don't be afraid to use the TrimDynamic or Clip brushes. It's not a bad idea to have hard edges to define the big shapes of the model at this point.


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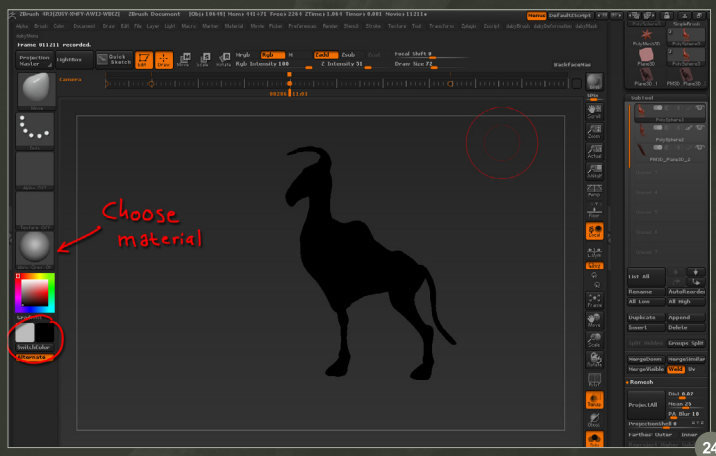

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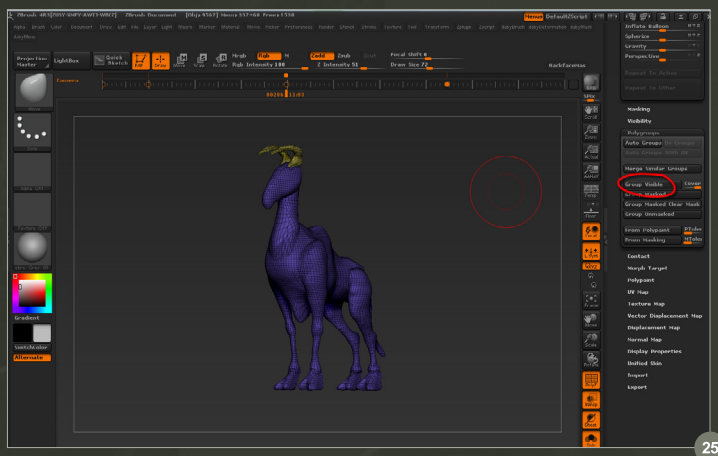
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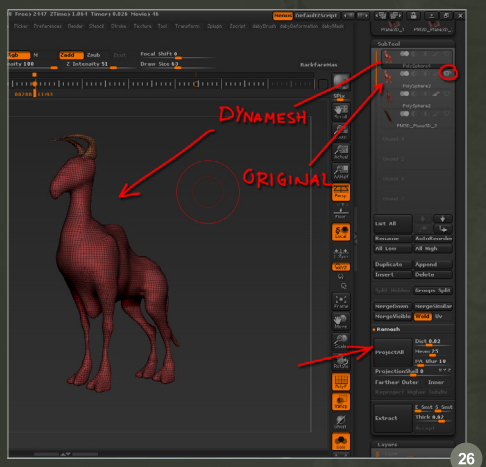
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Work on layers when trying out an idea that you are not sure of. Then you can easily turn it off, store a morph target at Tool > Morph Target > StoreMT, turn the layer back on and paint away the areas that you want to delete the sculpting on by using the Morph Target brush.

To try out different sculpt versions, you can turn off a layer and set a snapshot of the document (Shift + S), turn on the layer and move the model to the side. Now you can compare the two versions by looking at them at the same time. I find this very helpful in order to decide on different directions for the design (**Fig.22**).

Try to get some rhythm/curvature in the legs of the creature, as legs that are too straight look unnatural and stiff (**Fig.23**).

Use a silhouette to make it easier to analyze the big forms. Choose a matcap material to avoid spec on your silhouette. Then make sure you have black and white in the color swatch. Switch between the two colors to quickly check your silhouette (hotkey V). If your model has polypainting on it you can deactivate this temporary at the Tool > Subtool > Brush icon (**Fig.24**).



26

Mid-Forms

It's time to combine the geometry islands with DynaMesh. Duplicate the original subtool and merge the polygroups of the separate geometry islands, except the horns. Hold Ctrl + Shift and click the horns, then invert visibility by holding Ctrl + Shift and dragging on the document outside the model. After that you can choose Tool > Polygroups > Group Visible and show all geometry by holding Ctrl + Shift and clicking on the document outside the model (**Fig.25**).

Now you can convert the model to a DynaMesh with a resolution of 128. After converting to a DynaMesh the geometry loses its shape. It's time to project it to the original version in order to get the old shape of the model onto the new geometry. Divide the model three times to get more subdivisions in order to get a more defined sculpt when projecting. Go to Tool > Subtool and choose Project All.

To achieve good results, you can project one subdivision at a time. Start with subdiv 1 and project it, then step up to subdiv 2 and project it, and so on. Make sure only the original body and the new DynaMesh'ed version is visible in the Subtool menu. You can turn Visibility on and off with the eye icon in the Subtool menu. After the projection you can delete the old model with Tool > Subtool > Delete (**Fig.26**).

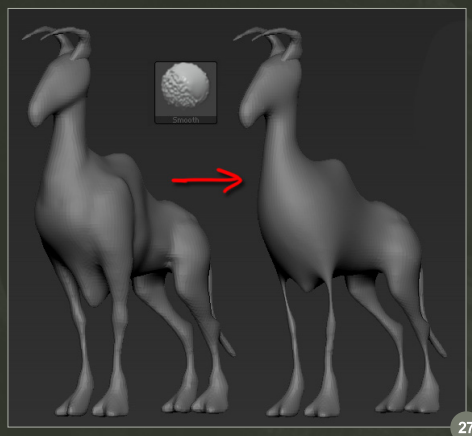
Now it's time to refine the model and add more mid-level details. When doing this I usually use the following brushes:

- **Standard brush**: I described this brush in an earlier section

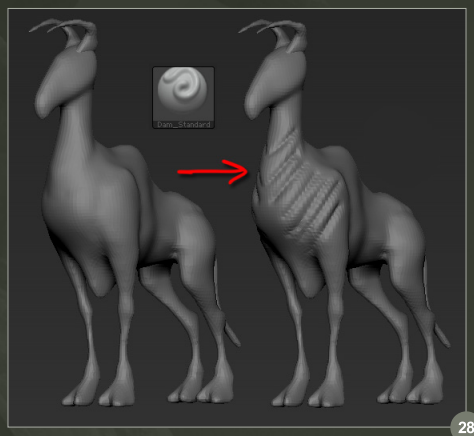
- **Smooth brush**: smooths out the details and evens out the surface. It's good to work with this brush on different subdivision levels. You get a more powerful smooth on the lower subdivisions and a lower smooth on the higher divisions. More polygons mean less smoothing. Press Shift to access this brush (**Fig.27**).

- **Dam_Standard:** cuts into the mesh in a nice way. This brush is set to "sub" by default, which means it removes volume from the surface. It has a really small alpha, so it always gives a stroke with a smaller radius than the current size of your brush. It's a nice workflow to alternate between Dam_Standard and Smooth **(Fig.28**).

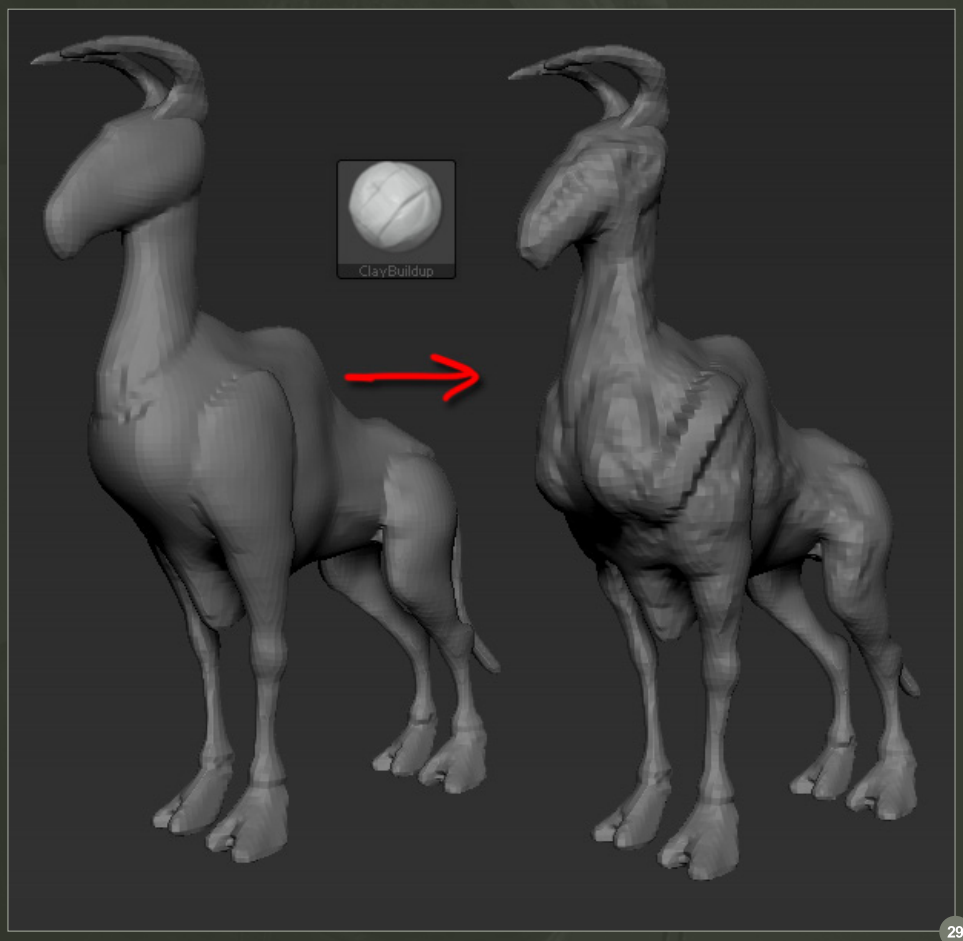
- **ClayBuildup**: builds up volume and looks very natural. It resembles the Standard brush, but generates a more even and flat surface. Unlike the Clay brush it keeps adding volume all the time during your stroke, whereas the Clay brush only builds to a certain point (**Fig.29**).



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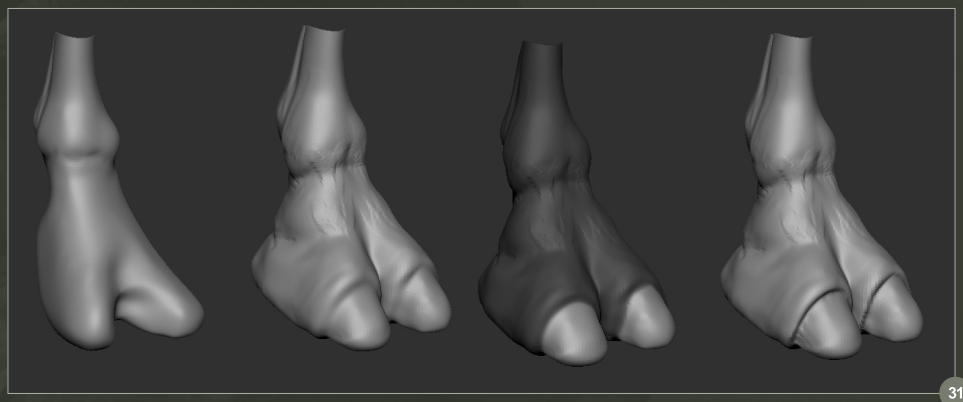
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Continue to refine the model with the different tools and brushes. Cut with Dam_Standard and smooth out the mesh. Use ClayBuildup or TrimDynamic on areas that seem a bit lumpy and smooth them out (**Fig.30**).


30

When sculpting the foot there is overlapping geometry on the transition between the skin and the hoof, which creates a defined edge. Create this overlapping by masking out the hoof and then invert the mask by holding Ctrl and clicking the document outside the geometry. After that use the Move brush to move the hoof in and create the overlapping. Don't worry about

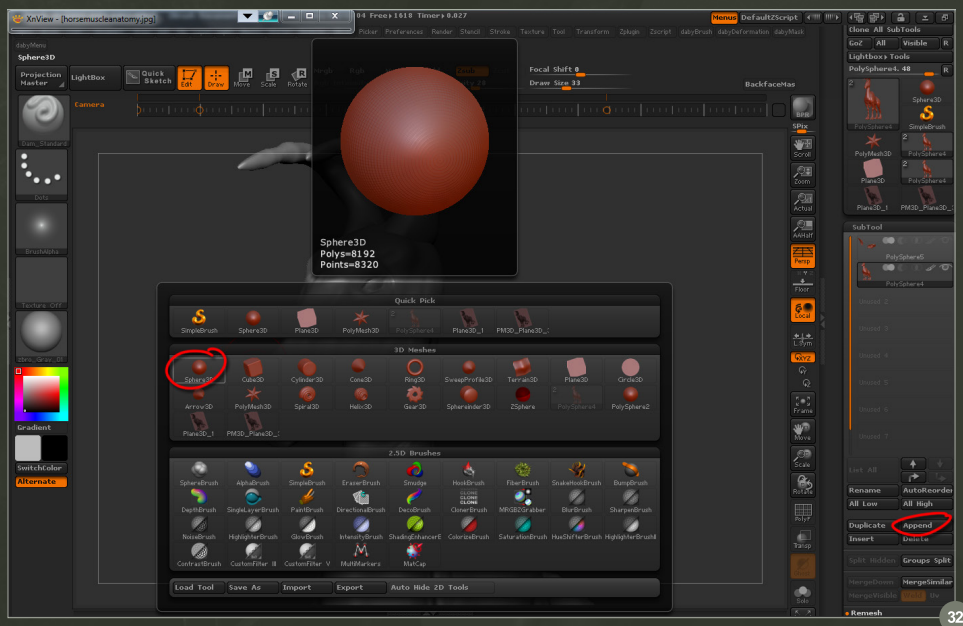
sculpting the feet on the hind legs. We will copy the front feet to the back later on (**Fig.31**).



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It's now time to add an eye. Append the Sphere3D (Tool > SubTool > Append) and move it over to the model's right side (+X). You can scale it down with the Transpose Line tool (E). After that you can mirror it over with Tool > Geometry > Mirror and Weld (**Fig.32**).

In order to sculpt around the eye you will need to temporarily turn the transparency on. This will make all subtools except the active one transparent, and you can sculpt eyelids without having the eye blocking the surface of the face behind it (**Fig.33**).



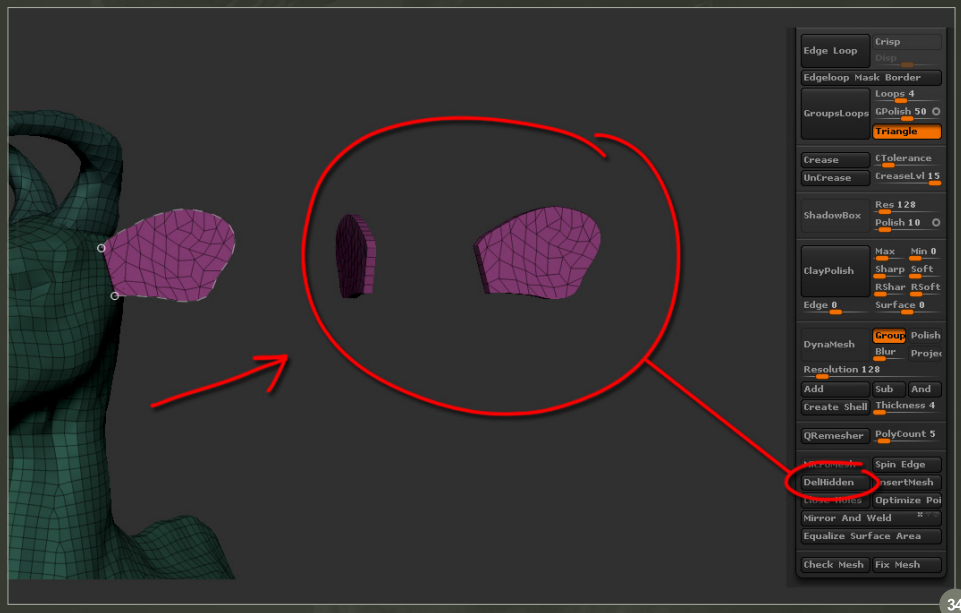
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The face is lacking a bit of personality, so let's add big, floppy ears! I won't follow the concept sketch, but make the ear stand out from the head a bit more. At the moment I will keep it as a separate subtool, so that I can sculpt it without worrying about the messing with the body.



33

To create the ear, duplicate the body, bake all layers (Tool > Layers > Bake All), go down to subdiv 1 and delete the higher subdivisions. Then select the CurveQuadFill and create a nice profile for the ear. After that you can isolate visibility on the ear by holding Shift + Ctrl and clicking it, and delete the hidden polys with Tool > Geometry > DelHidden (**Fig.34**).



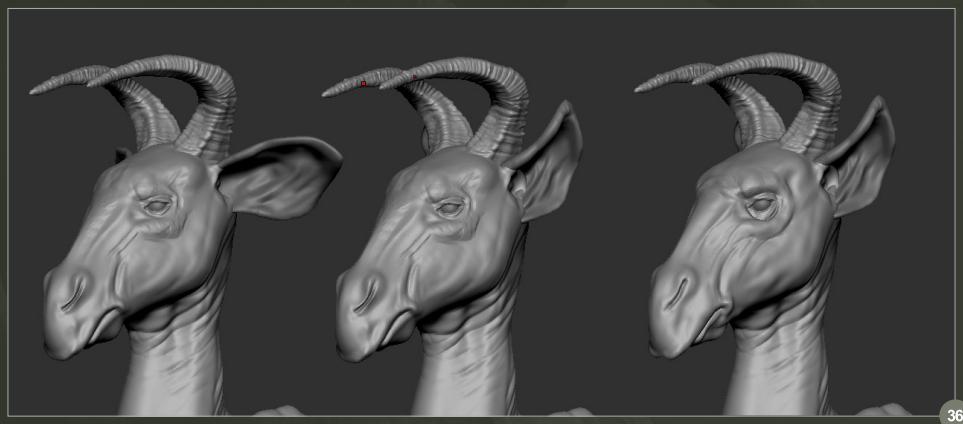
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When refining the horns it's good to mask the polygroup of the horns with the Transpose Line tool and Ctrl + clicking the horns. Start by sculpting the grooves of the horns with the Dam_Standard and Standard brushes. Then add the bulge that goes along the horn with the Standard brush. Please note that the Standard brush does not destroy any detail that already exists, unlike the Clay brushes (**Fig.35**).



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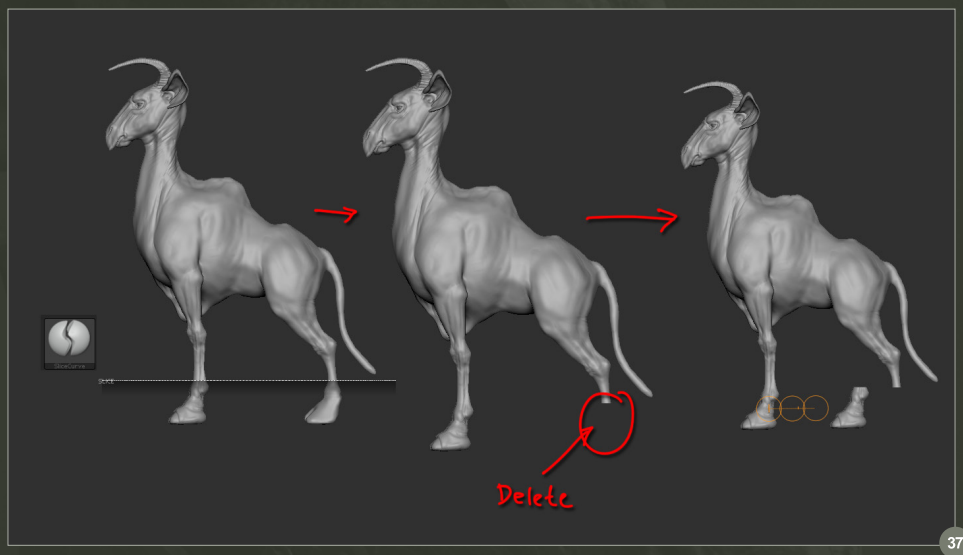
Continue to refine the face. I've changed my mind about the ears and made a decision to make them look more like they do in the concept. The first 3D ears we've done make the creature look like a common sheep or goat (**Fig.36**).



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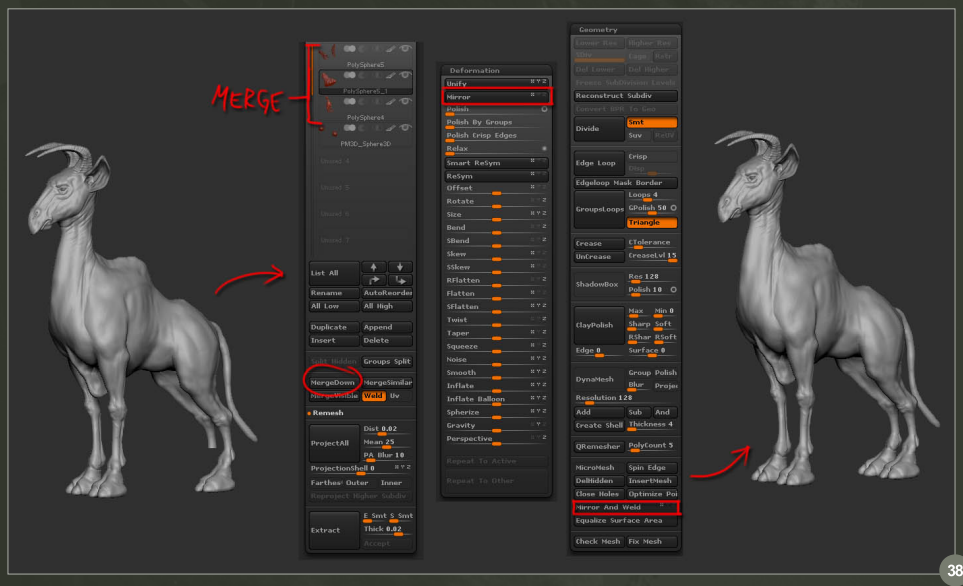
It's time to copy the feet to the hind legs. Use Slice Curve to cut out the feet. This will add an edge loop at the cut and put the feet in a separate polygroup. Isolate visibility on all but the back feet. Do this by going into Move mode (W) and Ctrl + clicking the feet. Mask out the front feet so that everything but the back feet is masked.

Now invert the mask by Ctrl + clicking the document outside the geometry. Hide any unmasked polys with Tool > Visibility > HidePt. Now choose Tool > Geometry > Del Hidden to delete the back feet. Duplicate the model and repeat the steps in order to delete all but the front foot. Choose Tool > Geometry > Close Holes to avoid a mesh with holes in it. Finally place the foot at the base of the hind legs (**Fig.37**).



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Merge the ears, body and feet with Tool > Subtool > MergeDown. Mirror the merged subtools, so that the missing foot is on the negative side of the X axis (Tool > Deformation > Mirror). To make a symmetrical mesh, go to Subtool > Geometry > Mirror and Weld (**Fig.38**).



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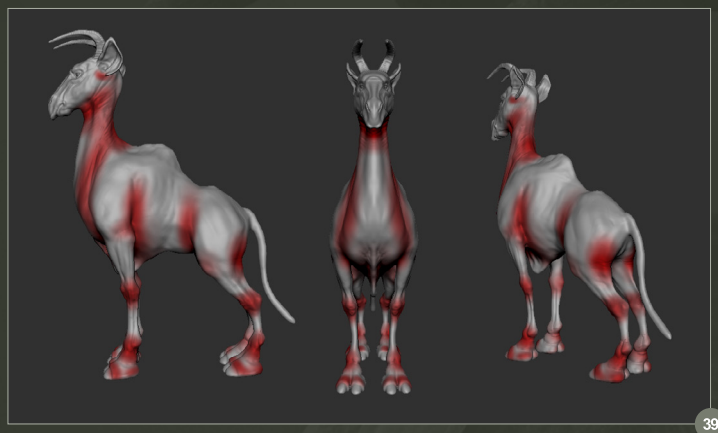
In order to mirror and weld, we deleted all but the highest subdivision on the model. I prefer to work on multiple subdivisions, so we are going to duplicate the model again. Then convert it to a rather low poly DynaMesh with Group on and a resolution of 200 to get geometry separation between the head and ears. Then divide it and project it to the original subtool (For an example of this workflow see Fig.26).

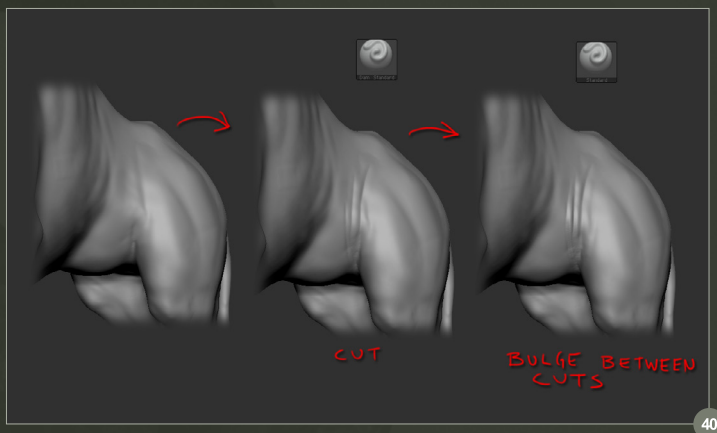
Make sure that you have the horns as a separate polygroup and the rest of the model as another polygroup in order to get a better separation and definition between horns and skin. The polygroup workflow was described earlier in Fig.25.

Small Forms

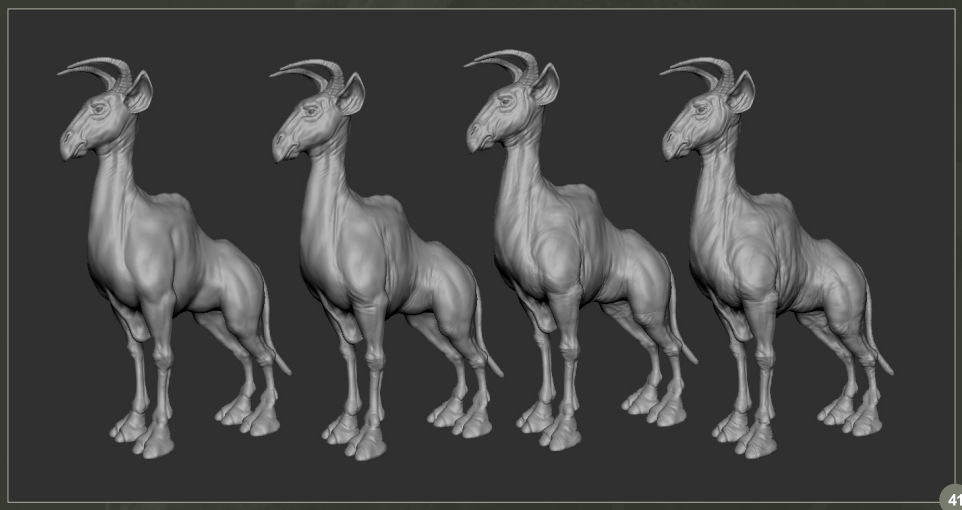
Now it's time to add wrinkles and other types of small details to refine the model. Don't forget to always work with layers when you sculpt. Try something out and if you don't like it you can delete the layer.

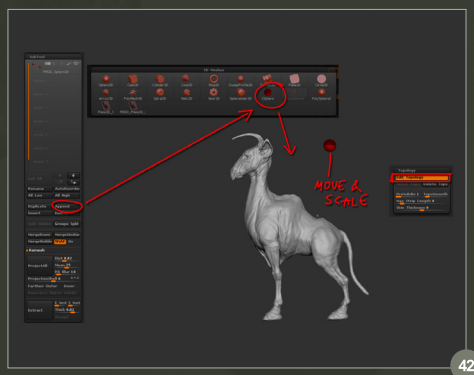
When creating wrinkles you should think about where they naturally appear. At the joints and the neck there is usually a lot of twisting and


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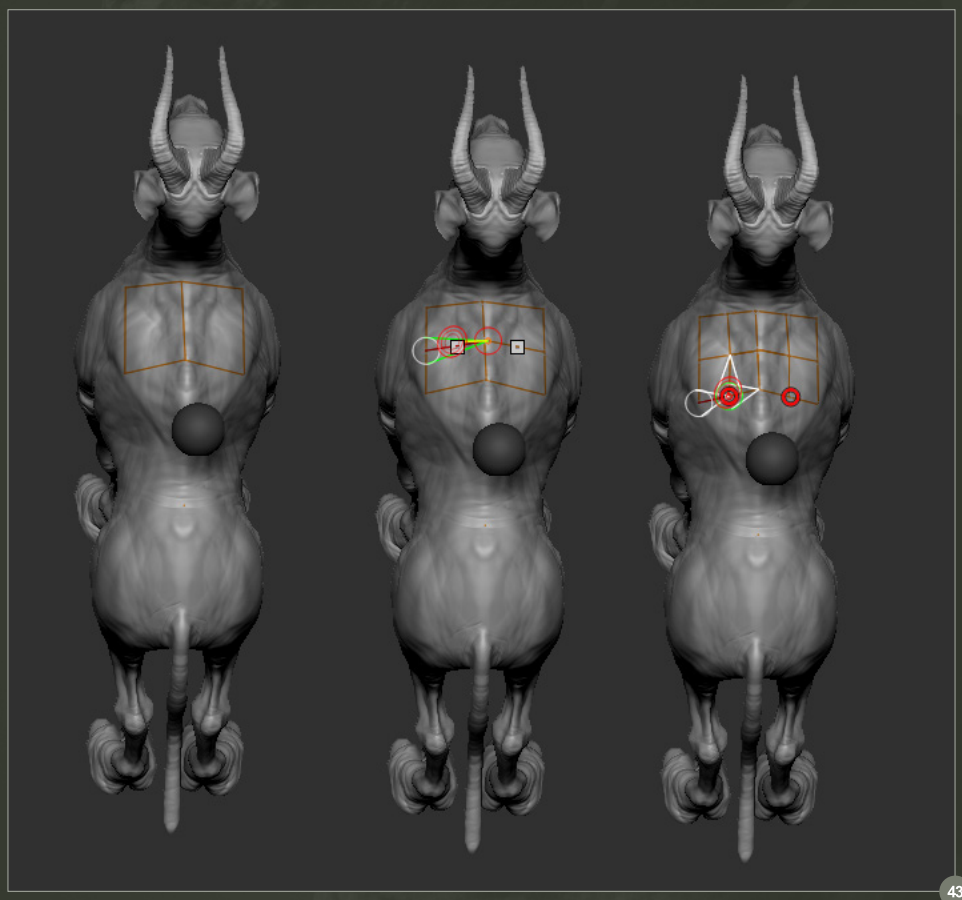


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bending of the skin. I have painted a rough guide in red where the areas that wrinkles usually appear are. It's also good to check references to find areas where wrinkles occur (**Fig.39**).

The process for sculpting wrinkles is to use the Dam_Standard brush to cut into the area first and then use the Standard brush to bulge out the areas between the cuts (**Fig.40**).

In **Fig.41** you can see how the creature develops as I progress in sculpting the wrinkles.

Adding Props

Now we are going to add the props to the creature. Append a ZSphere with Tools > Subtool > Append and place it where it's not in the way. Then go down to Tool > Topology > Edit Topology in order to create a new mesh with specific topology (**Fig.42**).

Now go into Draw mode by using hotkey Q and create the topology for the saddle. You can select points with W and remove points with Alt + clicking when in Draw mode (**Fig.43**).

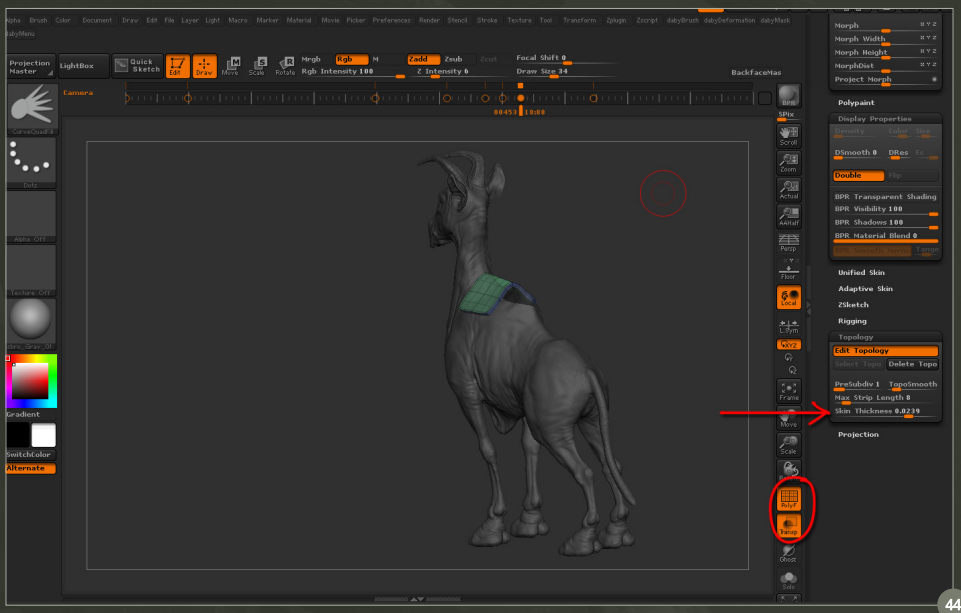
To see the created geometry you can press A. You can add thickness to the created mesh in Tool > Topology > Skin Thickness. In **Fig.44** I have turned on the transparency and polyframe.

Convert the adaptive skin to a polymesh with Tool > Adaptive Skin > Make Adaptive Skin. Append the created object and delete the created topology of the ZSphere with Tool > Topology >Delete Topo. You can go back to the ZSphere and repeat the process to create new objects (**Fig.45**).

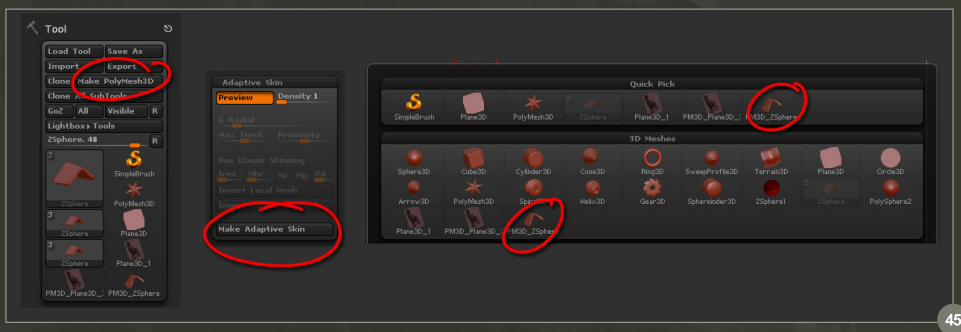
In order to create the support for the back on the saddle you must hide all polygons, except the ones that you wish to extract. You can use the Select Rectangle or Select Lasso tool for this (Ctrl + Shift). Mask off those polygons and make sure the E smt and S smt values are at 0 under Tool > Geometry. Then press Tool > Geometry > Extract (**Fig.46**).

The back support is not high enough, so we are going to extrude the polygons a bit. Ctrl + Shift + click the polygroup facing up to hide all the other polygroups. Mask the visible polygons by Ctrl + clicking the document outside the model. Ctrl + Shift + click the document outside the model to show all polygroups.

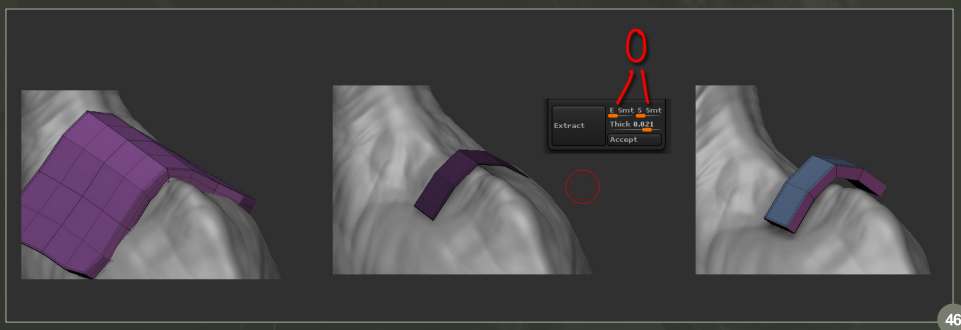
Activate the Transpose tool by pressing W and drag a transpose line in the Y axis. Now hold Ctrl + Shift and drag the white, middle circle on the Transpose tool in order to extrude. Repeat the extrude process a couple of times until you reach the desired height (**Fig.47**).



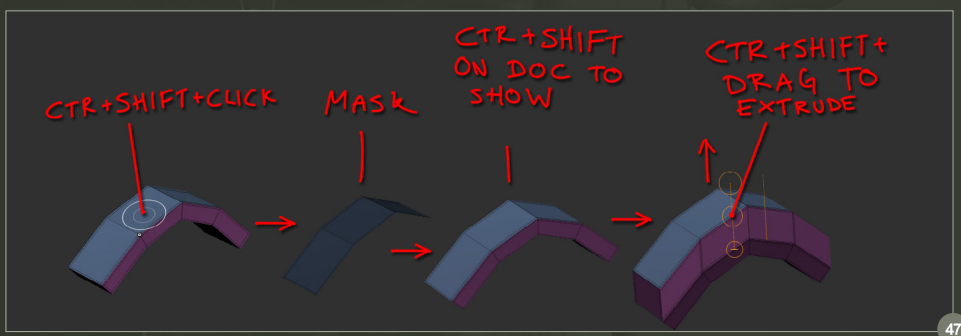
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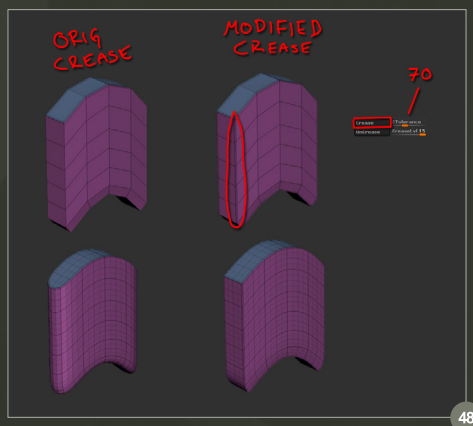
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If the model was divided you would see that the creasing is not the way we want it. Fortunately ZBrush can crease edges depending on curvature. Go to Tool > Geometry and set CTolerance to 70. Then press the Tool > Geometry > Crease to crease the edges. You can remove creases by Shift + clicking Tool > Geometry > UnCrease. If only a portion of the polygons are visible then the border edges will be creased when you press Crease (**Fig.48**).

When using the Standard and Move brushes to deform the back support, it is easy to mess up the hard surface look. A nice way to deform is using the Transpose tool. If you Alt + drag one of the transpose points, you deform it with auto masking (**Fig.49**).

Before you subdivide you want to make sure you have a symmetrical topology, so use Tool > Geometry > Mirror and Weld to do so.

Continue to create the saddle by using the tools that are mentioned in the earlier sections (ZSphere retopology, Extraction, Extrude and Tool > Subtool > Duplicate). When adding the metal ring for the bridle, you can use Tool > Subtool > Append and choose ring3D from the 3D meshes pop up menu.

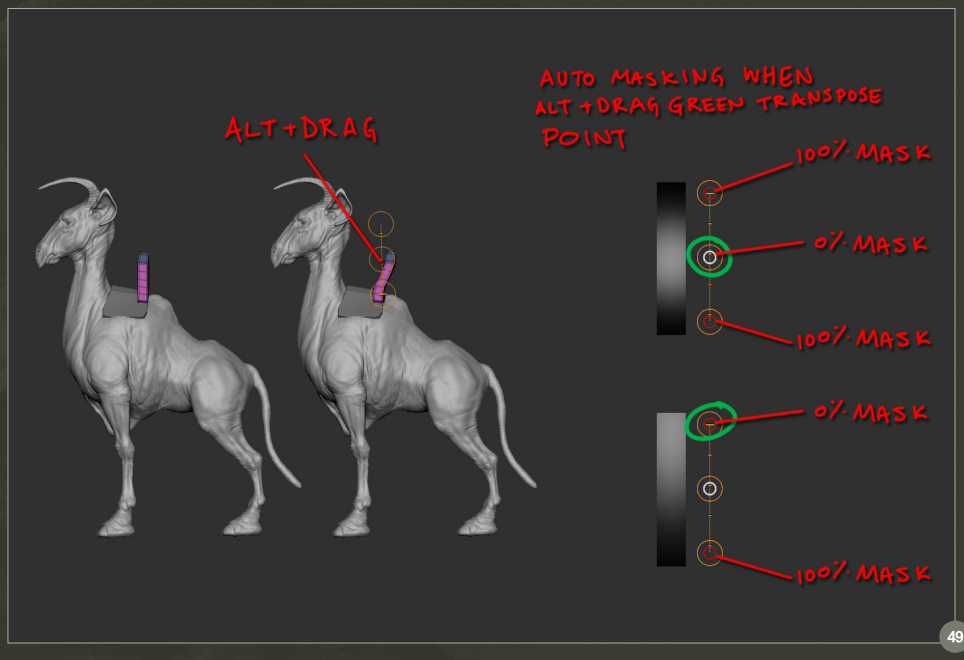
In **Fig.50** you can see that I have also used polypainting on the body of the creature to try out the design of the leather straps before I model them. It's nice not to have to think about design when doing topology.

Let's create the belt buckle for the saddle strap (**Fig.51**). Choose plane3D from the 3D meshes menu, and append a ZSphere and move it out of the way. Activate Tool > Topology > Edit topology and draw out the topology (1).

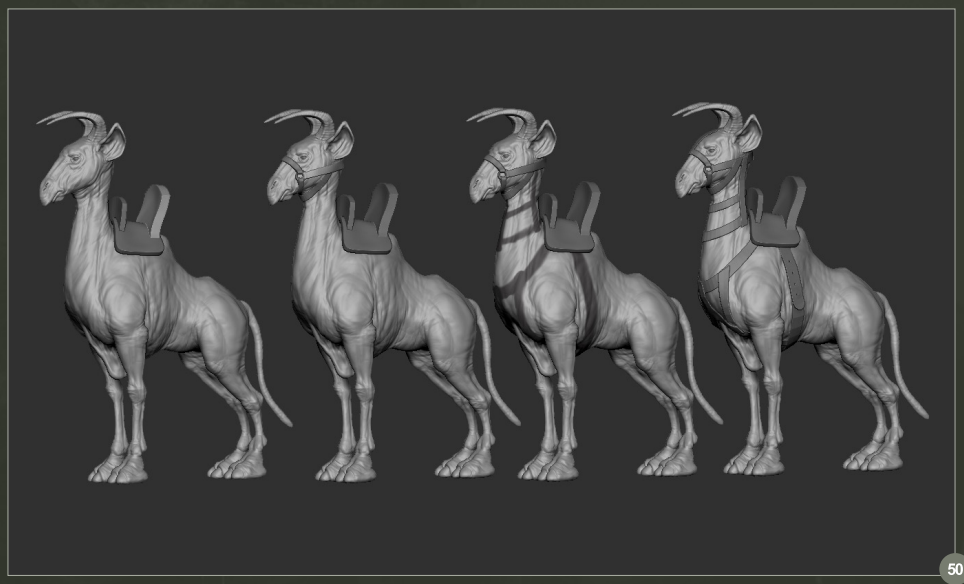
Set Tool > Topology > Skin Thickness to 0.1 and preview adaptive skin with hotkey A (Tool > Adaptive Skin > Preview). Also set Tool > Adaptive Skin > Density to 1. Then choose Tool > Make PolyMesh 3D to create a PolyMesh (2).

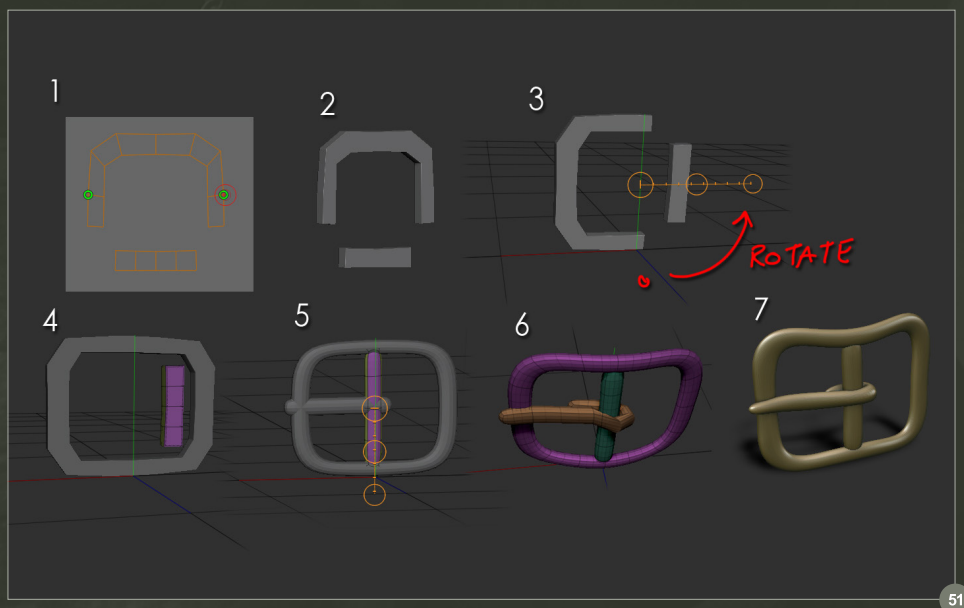
Go into Rotate mode (R) and use the Transpose tool to rotate the geometry, so it's going along the X axis (3). Duplicate the model and use Tool > Geometry > Mirror and Weld (4). Go back to the subtool with the pin and delete all the geometry apart from the pin. Duplicate the pin and rotate it 90 degrees (5).

Merge all subtools into one and remove the creases by Shift + clicking on Tool > Geometry

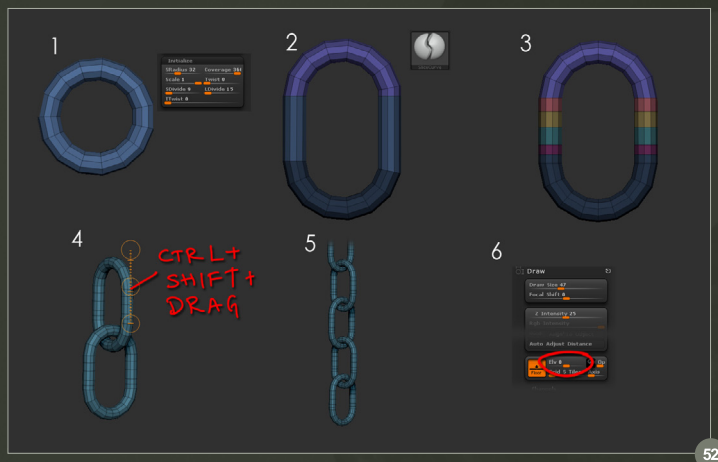


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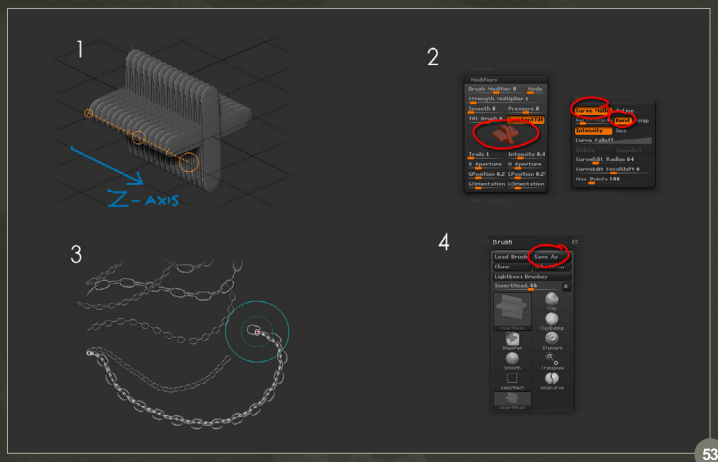

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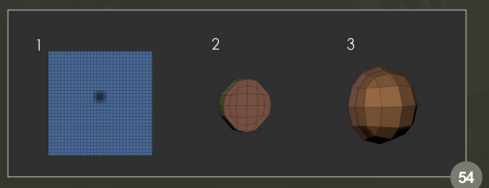


53

> UnCrease. Use Tool > Polygroups > Auto Groups to make a polygroup of each geometry island. Now it will be easier to mask (Ctrl + W) and move the different parts around. Now position the different parts and divide the geometry (6). If you get rid of some unwanted kinks in the geometry you can fix it by using Tool > Deformation > Polish (7).

In order to create the chain for the bridle, we are going to create a brush (**Fig.52**). Go to the Tool menu and select Ring3D. Change the setting so it's a lower poly (1). Convert it to a mesh with Tool > Make Polymesh 3D. Use the Slice Curve brush and make an edge loop in the middle. Mask off the top and drag it up with the Transpose tool (2). Then add some more edge loops (3).

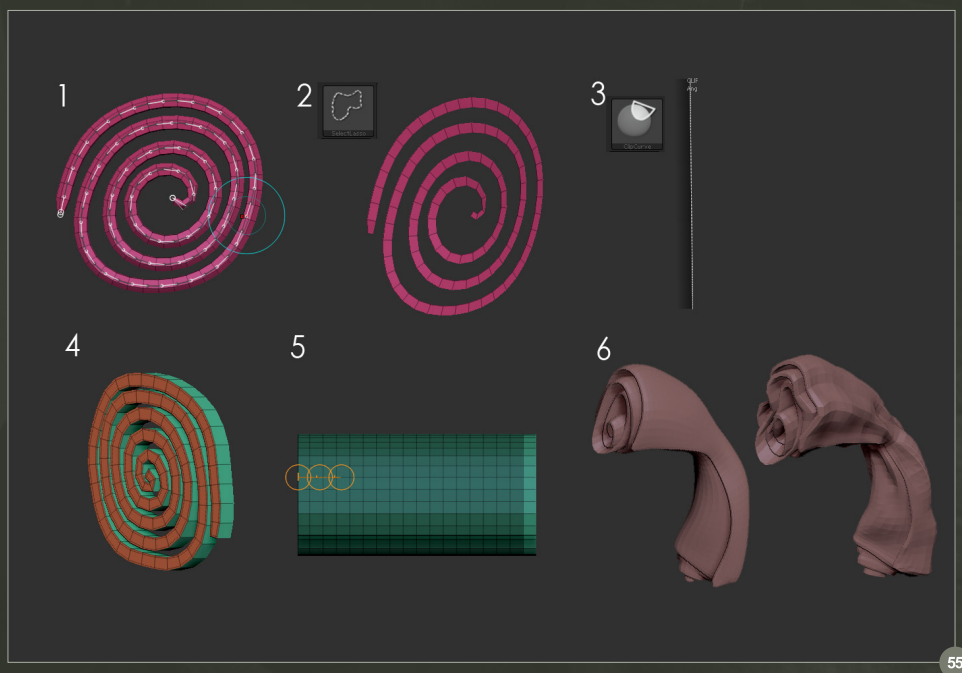
Clear the mask and make a copy by Ctrl + Shift + dragging the white middle dot on the transpose line (4). Clear the mask and drag out a new copy of the two rings. Repeat this last stroke with hotkey 1 to duplicate a lot of rings fast (5). Set your floor grid by setting Draw > Elv to 0 (6).



54

Rotate and scale down the chains so they cover four floor grids (same size as a polyPlane3D if you need a reference) as seen in **Fig.53** (1). Select the Insert Head brush and choose Brush > Clone to copy it. Go to Brush > Modifiers and select the chain mesh that you've created as an insert mesh. Also go to the Stroke menu and activate Curve Mode and Bend (2).

Now you can try out the created brush. Remember that the radius of your brush determines the size of the chains. As long as the curve exists you can change the brush size when it is outside of the curve (red icon) and click the curve to resize the chains (3). Don't forget to save your brush once you are done.



55

We also need to create a brush for the studs (**Fig.54**). Select polyPlane3d in the Tool menu and convert it to a mesh with Tool > Make PolyMesh3d. Mask out four polygons (1) and use Tool > Geometry > Extract to create a new mesh (2). Use Tool > Deformation > Polish to make it rounder and delete the backside of the mesh (3). Make sure the stud is facing the Z axis, a positive direction. Go to Brush > Modifiers and select the stud mesh as an insert mesh. Save the brush.

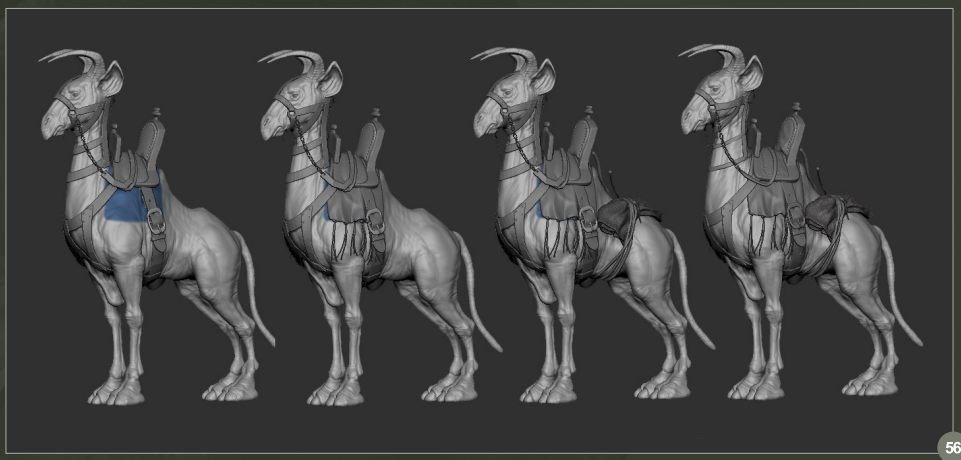
Let's create the blanket that is wrapped up and tied to the creature's back. Start by appending a PolyMesh3d, so you can select it and insert a tube with the CurveTube brush. Also set the Brush > Modifiers > Brush modifier to 5 to get a lower density tube. Draw out a tube as shown in **Fig.55** (1).

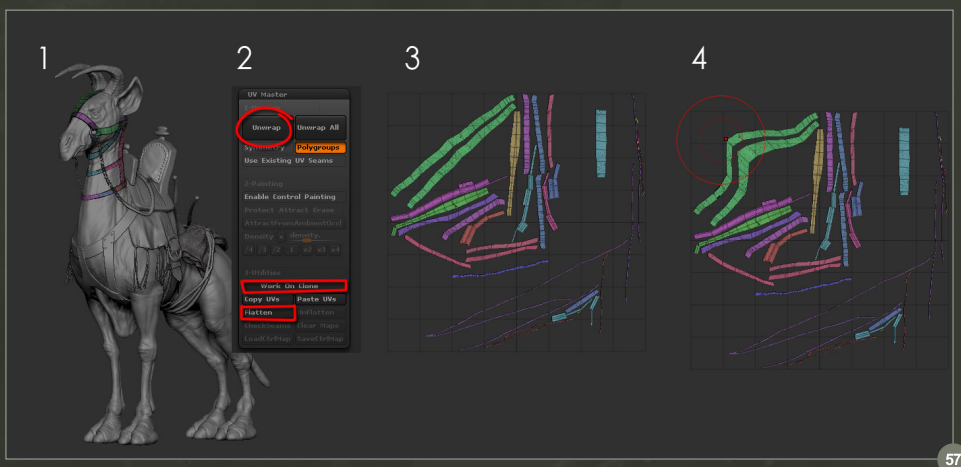
Use the Select Lasso tool and click on an edge to hide the edge loop. Then invert visibility by

Ctrl + Shift + dragging on the document outside the geometry (2). Delete the hidden geometry with Tool > Geometry > DelHidden. Rotate the camera to the side and use the ClipCurve brush to flatten the geometry (3). Mask the geometry and extract it with Tool > Subtool E Smt and S Smt at 0, so the extracted mesh won't be deformed (4).

Mask off one side and start extruding with the Transpose tool (W). As described in an earlier section you extrude by Ctrl + Shift + dragging the white middle dot on the transpose line. You can repeat the last stroke with hotkey 1 to extrude faster (5). Deform the blanket with the Transpose tool, Move and Standard brushes. Also use the Move Topological brush, which has an auto mask by topological distance (6).

Continue to add props and refine the shapes. Use the techniques that you have learned in the earlier sections. The prop development is illustrated in **Fig.56**.


56



57

Lay out UVs and add surface noise. Combine the straps on the lower parts of the body to decrease the number of subtools and allow easier management of the UVs. Make sure that all the subtools that will be combined have the same number of subdivisions in order to save the lower subdivisions. If you have three subdivisions on one strap and four subdivisions on another strap when merging, the lower subdivisions will be deleted. Use Tool > Subtool > MergeDown for this.

Once the straps have been merged we can do UVs. If this would be for production I would advise you to do your UVs in another application to get more control over placement and such. However, ZBrush does a very fast job of laying out UVs itself so we will do it with UV Master on this occasion.

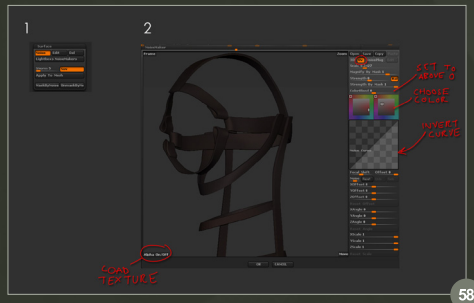
In this example we will do the UVs for the leather straps on the head, which can be seen in **Fig.57** (1). Go to ZPlugin > UV Master and activate Polygroups. This means that each polygroup will be a separate UV island.

Choose Unwrap to do an automatic UV layout. You can also attract the UV seams based on polypainting. You enable this feature by selecting Enable Control Painting. If you want to edit your UV, you have to choose Work on Clone (2).

ZBrush then creates a copy of your current subtool that only has the lowest subdivision left. If you press Flatten you will see the UV layout represented by a 3D polymesh (3). Edit the polymesh how you want to (4) and press UnFlatten to see the model again. Copy the UVs, then go back to the original subtool and paste them with ZPlugin > UV Master > Paste UVs. The UVs on your temporary clone will now be transferred to the original subtool.

Let's try out a quick texture on the straps. To colorize objects in ZBrush you can polypaint them, use a texture or surface noise. It is actually possible to combine polypaint and surface noise, which is what we will do. This technique will save time and polycount since we don't need to divide our model to get crisp details in the color (**Fig.58**).

Go to Tool > Surface/Noise (1). Then choose which texture you want to use in the left lower corner (Alpha On/Off). I want to colorize the bright parts of my texture, therefore I need to invert the curve (2). Also set the UV button to On, so the texture will be mapped by UV and not 3D space. Set the color blend to a bit higher and choose a color in the right color slot.



58

In **Fig.59** you can see all of my settings. Remember that you can save out this noise setting and use it again later, which can save a huge amount of time. It's also a nice time-saver to merge objects that share the same type of noise. Don't forget that you can also polypaint without affecting the noise. Activate polypainting by selecting a brush, turning off ZAdd and making sure that RGB is on.

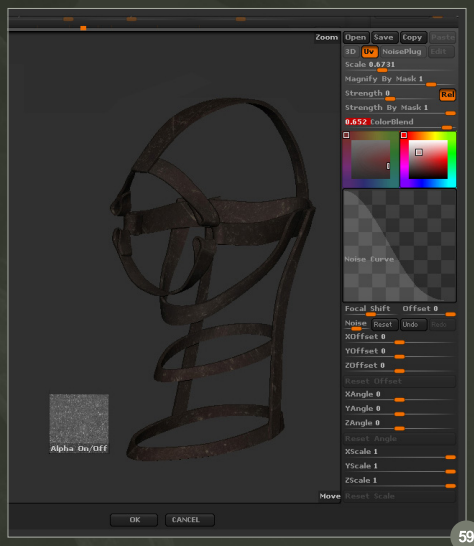
Continue to lay out UVs and create noise settings for the props.

Polypainting

Let's go over the workflow of polypainting and texturing in general. To polypaint an object make sure that ZAdd and ZSub are off, and RGB is on in the menu just above the document. When I'm texturing I'm thinking about the following things.

General Base Color and Gradients

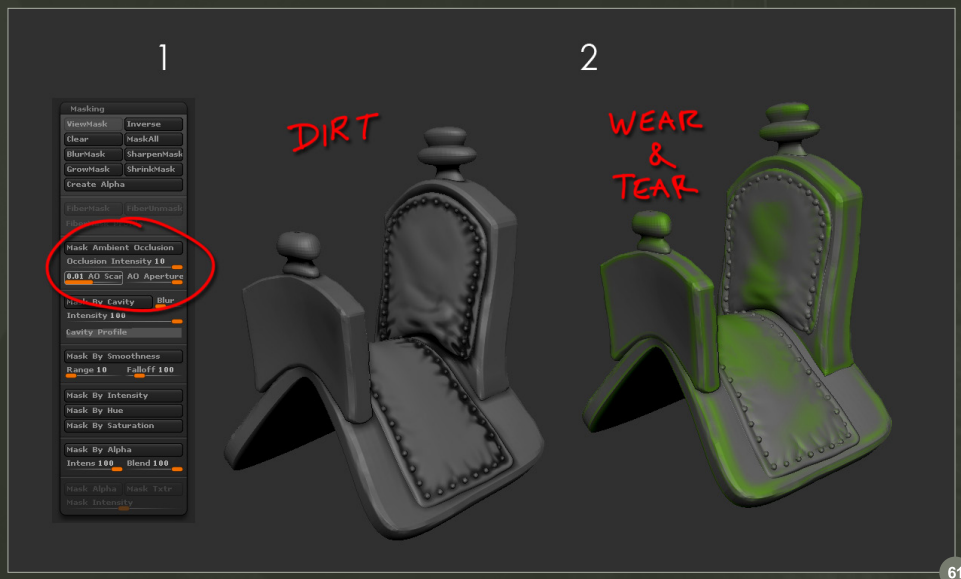
This is the basic color of the object, using gradient to vary values and hue (**Fig.60**). Adding



59



60



61

gradients is a great way to avoid a flat-looking texture. See the comparison of point 1, which has a flat color and point 2, which has some gradients, wear and tear in the polypainting. Both the versions to the right also have fine details (surface noise) added to the texture.

Dirt, Wear and Tear

Dirt is collected in the cracks and crevices of objects (**Fig.61**). In ZBrush you can use Occlusion to mask off the dirt, invert the mask and then paint. Make sure that the Occlusion Intensity is set to 10. Ambient Occlusion Scan Distance sets the distance for the ray trace when checking for occlusion (1).

Wear and tear happens to surfaces that are often colliding with other objects, which regularly happens to corners of objects. I have painted these areas green to give an example (2).

Fine Details

This is the part of the texture that shows those small, crisp details. In this tutorial the texture that we set in surface noise represents that kind of detail (see versions to the right in Fig.60). Surface noise can only use one texture though.

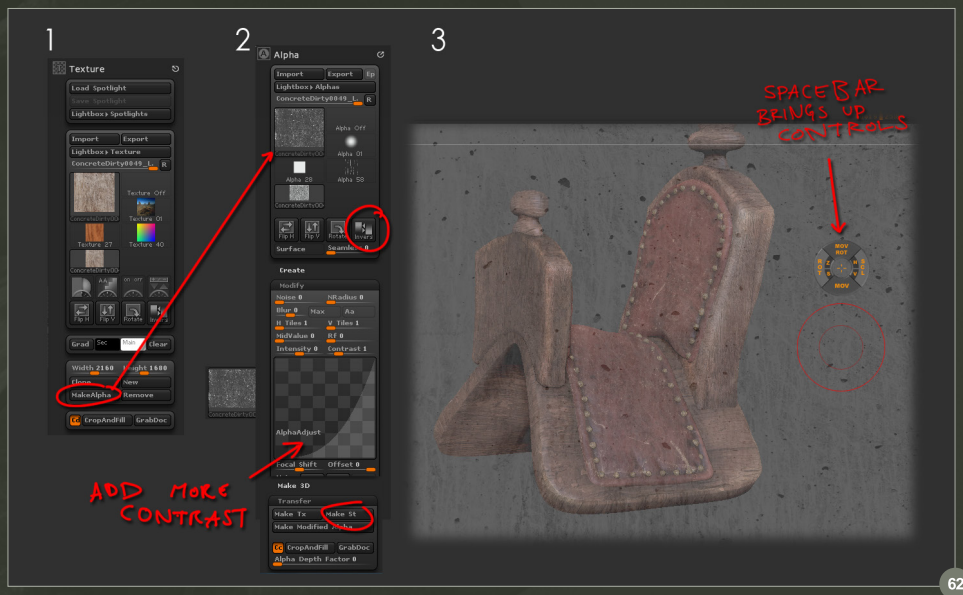
I like to paint in some dirt and grime not only in the crevices of the objects, but on the smooth surfaces too. This needs to be a bit more subtle than the dirt in the crevices. I usually create a new layer in Tool > Layers and polypaint that

kind of feature on the layer in order to dial it up or down later on.

When painting on layers you can use Alt + draw to erase polypainting on the recording layer. Spotlight is a great tool, but does not have a smooth falloff between 100% opacity and 0% opacity when projecting textures. Therefore we will use a stencil instead (**Fig.62**).

Import a suitable texture in the Texture menu. Then press MakeAlpha (1). In my case I want to paint in the dark areas of the texture and need to invert it (2). I also want to increase the contrast in the texture so that my polypainting has better definition. After I'm satisfied I press Alpha > Transfer/Make St to make a stencil.

Now the stencil pops up in the document viewport. If you press the spacebar you can move it, rotate it, scale it etc (3). To hide the stencil while painting you can press Ctrl + H. If you want to turn off the stencil completely you can press Alt + H. You can also check the stencil menu for more controls.

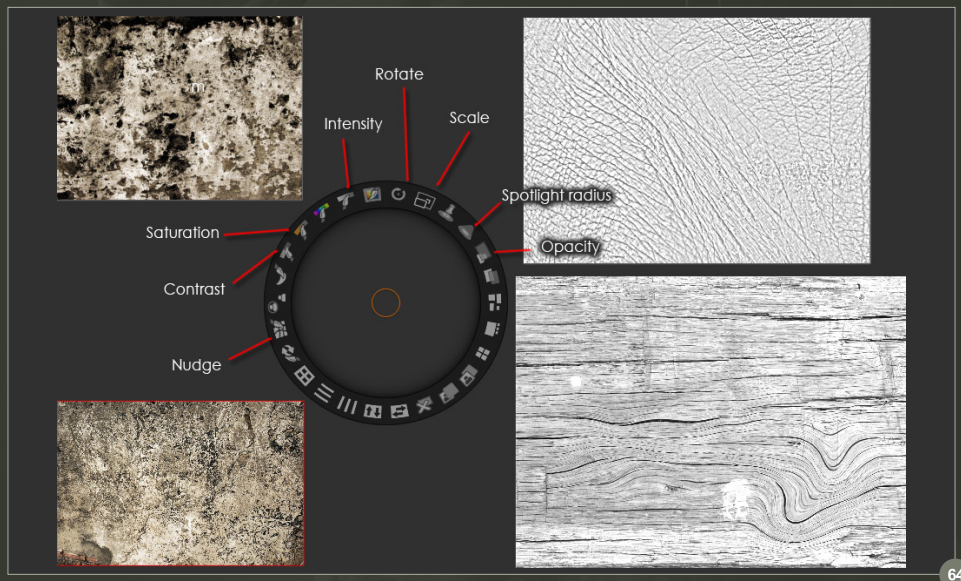


62


63

In **Fig.63** you can see the progress of polypainting the saddle. Repeat these steps for the rest of the props.

Now it's time to polypaint the creature's skin. We will also sculpt the highly frequent details in the skin. Spotlight is a great way to paint and project textures onto your model. You have to make sure you have a high polycount on your mesh to get a good resolution on your polypaint. My polycount is just above seven million polys on the body. Also remember that you are painting in screen resolution, so you want both your model and the texture to be as big as possible when you are polypainting, to ensure that you won't lose texture resolution.



64

To load a texture into Spotlight you go to Texture > Add to Spotlight. If you have loaded multiple textures into Spotlight, you will only affect the texture with a red frame on it. Click a texture to make it the active texture. To turn Spotlight on or off you press Shift + Z or use Texture > Turn on Spotlight.

When the control wheel is shown you can manipulate the textures. To go into Polypaint mode with Spotlight, on press Z. The spotlight wheel should disappear, but the texture should still be visible.

You can see some of the controls in the Spotlight wheel that I use the most in **Fig.64**.

Nudge is a way of distorting the shape of the texture (for example the lower right texture in **Fig.64**). You activate Nudge and drag with the brush on the texture to distort it. You can use Shift to smooth the distortion. You can also drag the Nudge icon to restore the original shape of the texture. You can also use D and Shift + D to step up and down in texture subdivision.

ZBrush 4R3 can't handle blending modes when it comes to polypaint layers, so I find it helpful to paint textures with high contrast and lower the layer opacity to show the underlying polypaint.

When it comes to saturation I tend to desaturate textures that I'm going to use for mask, bump or displacement. Drag the icon and rotate the wheel counter clockwise to desaturate and clockwise to saturate.

When painting textures that are going to be a base for masking I turn up the intensity, so that the areas that should be unmasked are white.

When painting wrinkles it's important to get the right flow and direction of the wrinkles, so rotate and use Scale to scale the active texture.

When the Spotlight Radius is on you can't see the texture while polypainting and pressing down the mouse/stylus. It's good to use this if the spotlight texture overlay is distracting.

Opacity increases or decreases the opacity of all spotlight textures. This does not affect the polypainting, but makes the mesh easier to see through the textures.



65

Now we will paint the skin wrinkle texture, which we will put on a new layer. This will be used as a base for masking out the wrinkles for sculpting later on. Some people sculpt skin with alphas, but I find that using alphas makes the skin look repetitive and inorganic. Alphas are great for repetitive details and hard surface details. They can also be used for organic stuff, but I only use them when dealing with non-repetitive and non-overlapping stuff.

Bring in a skin texture and use the Spotlight controls, so that it's basically white with some darker areas where the wrinkles are. Switch to the BumpViewerMaterial in the Material menu and set the Color bump in the material settings to about -0.5. This material displays color intensity as bump in the material. Please note that the bump effect is in screen space, so it will look exaggerated when you zoom out with the camera.

Fig.65 (1) shows the model with the wrinkle polypainting and the SkinShade4 material; point 2 shows the BumpViewerMaterial settings and point 3 shows the polypainting with the BumpViewerMaterial.

When you are done with the wrinkle polypaint, you can switch back to the skinShade4 material and mask by color intensity in Tool > Masking > Mask by Intensity, as shown in **Fig.66** (1). Now invert the mask and create a new layer (2). Turn off the layer with the wrinkle polypaint and set the new layer to Rec again. Now you can use the Standard brush with a low Z Intensity and a big brush size to sculpt the wrinkles (3). Don't forget that you can hide the mask with Ctrl + H.

Now we can polypaint the color of the creature (**Fig.67**). All polypainting features should be made on separate layers, so that we can dial them up and down later on. Start by painting



66



67

in the general hues and values (base). After that, paint a highly frequent concrete texture (concrete). To break up the painting a bit you can paint in some spots on the creature's back (spots).

In Fig.67 the spots have a big black area for the sake of the presentation. This area is really transparent or unpainted. You can also use the mask from the wrinkle polypaint and paint black on a new layer in order to put some dirt in the wrinkles; I have exaggerated this in order to illustrate my point (skin cavity).

When you are done with the polypainting, you can start dialing back the layer intensity sliders to get the right look. Please note that the layer that is on top is in the bottom of the layers stack in Tool > Layers. You can see the final result and the layer opacity settings in **Fig.68**.



68

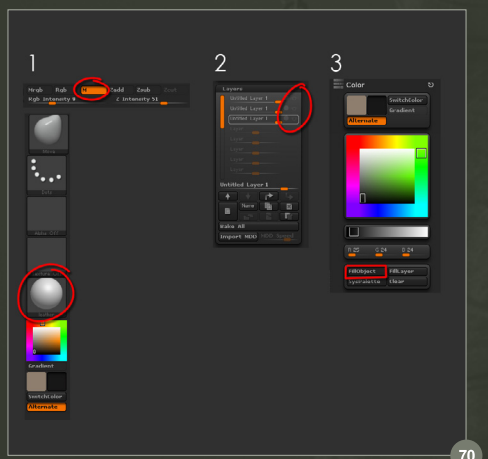
Posing The Creature

Go to ZPlugin > transpose Master and press TPoseMesh, demonstrated in **Fig.69** (1). ZBrush will then create a version of the character where all the lowest subdivisions of all subtools are merged together (2). Use the masking technique with the Transpose tool, which has been mentioned earlier. Go to Move mode (W) and Ctrl + Left Mouse Button + drag the legs to mask off the legs. Use the Transpose tool to rotate the legs into a pose (3).



69

If, for some reason, you need to do new polygroups, then export an object of the pose first. If you don't have the right polygroups, it can mess up the model when transferring the pose to the original model.



70

When you are happy with your pose it's time to transfer it back. If you did polygroup changes, then store a morph target of the model at Tool > Morph Target > Store MT, then import the object with the original polygroups.

Now press ZPlugin > Transpose Master > TPose>SubT and the pose should be transferred. If you get some kind of an error, export the pose as an object in Tool > Export, then choose the original model and press ZPlugin > Transpose Master > TPose>SubT. When ZBrush asks for a file on your hard drive choose the object with the posed mesh.

Setting Up Materials

Materials are applied to objects by poly painting with the material channel turned on, as seen in **Fig.70**. You can select which material to paint in the material slot in the left tray (1). When painting material you need to turn off all layers (2). Instead of painting with the brush, you can flood the entire mesh with the selected material at Color > Fill Object (3).

The settings for the materials are quite extensive to go through in detail in this tutorial.

I will give you some notes on a couple of the materials though. Please note that the only way to change the name of the material (that I know of) is to save them. Don't forget to Ctrl + hover over a material setting to show the pop up help text (**Fig.71**).

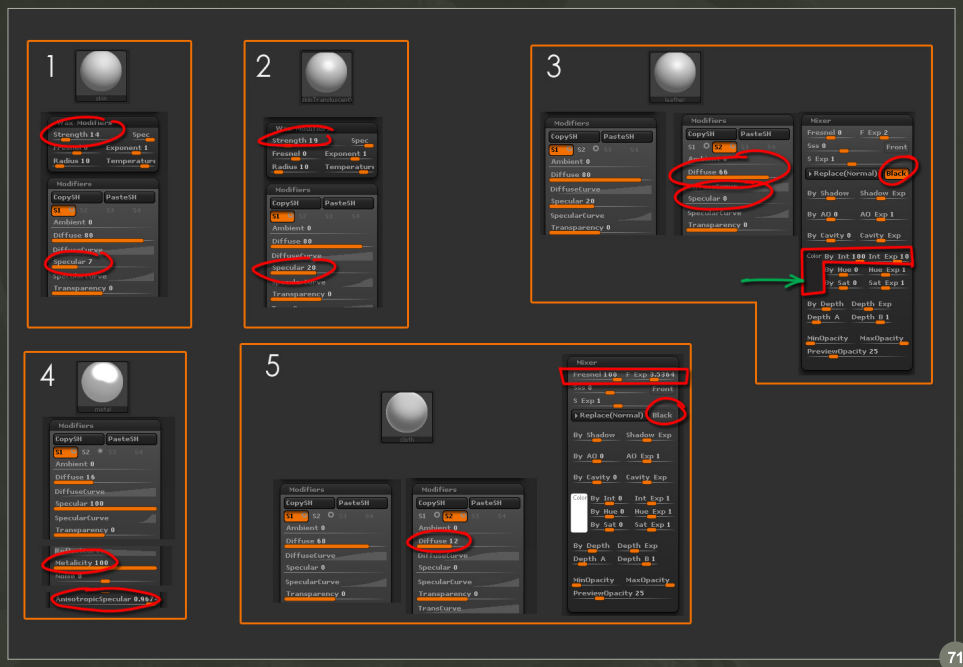
Skin is used for the main parts of the creature's body. I don't want a very SSS-looking material, so I set Wax Modifier > Strength to 14 and Radius to 10. ZBrush only has SSS for back scattering, so if you want front scattering you have to use the Wax modifier in the shader (1).

I've used SkinTranslucentWet for the inside of the ears, the snout and the eyelids. I want it to have a stronger SSS look than the rest of the skin, so I raise the Wax Modifier Strength to 19. I also feel that it should have a bit more of an oily feel to it, so I increase the Specular value and made a sharper specular curve (edited just below the Specular value in the shader) (2).

For the leather material I wanted the dirty, darker parts of the mesh to have less specularity. Therefore I selected the doubleShade1 material, clicked Material > CopyMat, chose another material and clicked Material > CopyMat to duplicate the original material.

The first shader (S1) doesn't have any special values besides Diffuse and Specular. The second shader (S2) is a copy of the first shader without any Specular. In the Mixer section of the shader you should set Black to On. This tells the shader to add shading from a black value. The default of black is off, which makes the shader brighter than I want it to be.

In the color swatch (marked by a green arrow) you can set a color. All polygons with a color value that are below the one in the color swatch will have the second shader applied to them. Intensity is basically the same as opacity and Intensity Exponent is basically the falloff of the shader (3).



71





For the metal material two things are important. Metalicity, which makes the specular inherit the color of the polypaint or texture, and AnisotropicSpecular, which spreads the specular as if it was brushed metal (4).

For the cloth I've used two shaders. The first (S1) is just a normal shader with a Diffuse setting. The second shader (S2) has a lower Diffuse value, which adds to the lighting on the first. The second shader's mixer setting is changed, so that the lighting is only applied to the polygons facing away from camera to achieve a sort of fuzzy look. This is done with Fresnel and F Exp. Be sure to set Black to Off, so that the second shader adds to the first shader's shading and doesn't just replace it (5).

Conclusion

I hope that you have enjoyed this tutorial. I have tried to show a lot of different solutions to creating the creature and the props. I hope that you have found all the tips and tricks helpful and that you will be able to use them to speed up your workflow.

Daniel Bystedt

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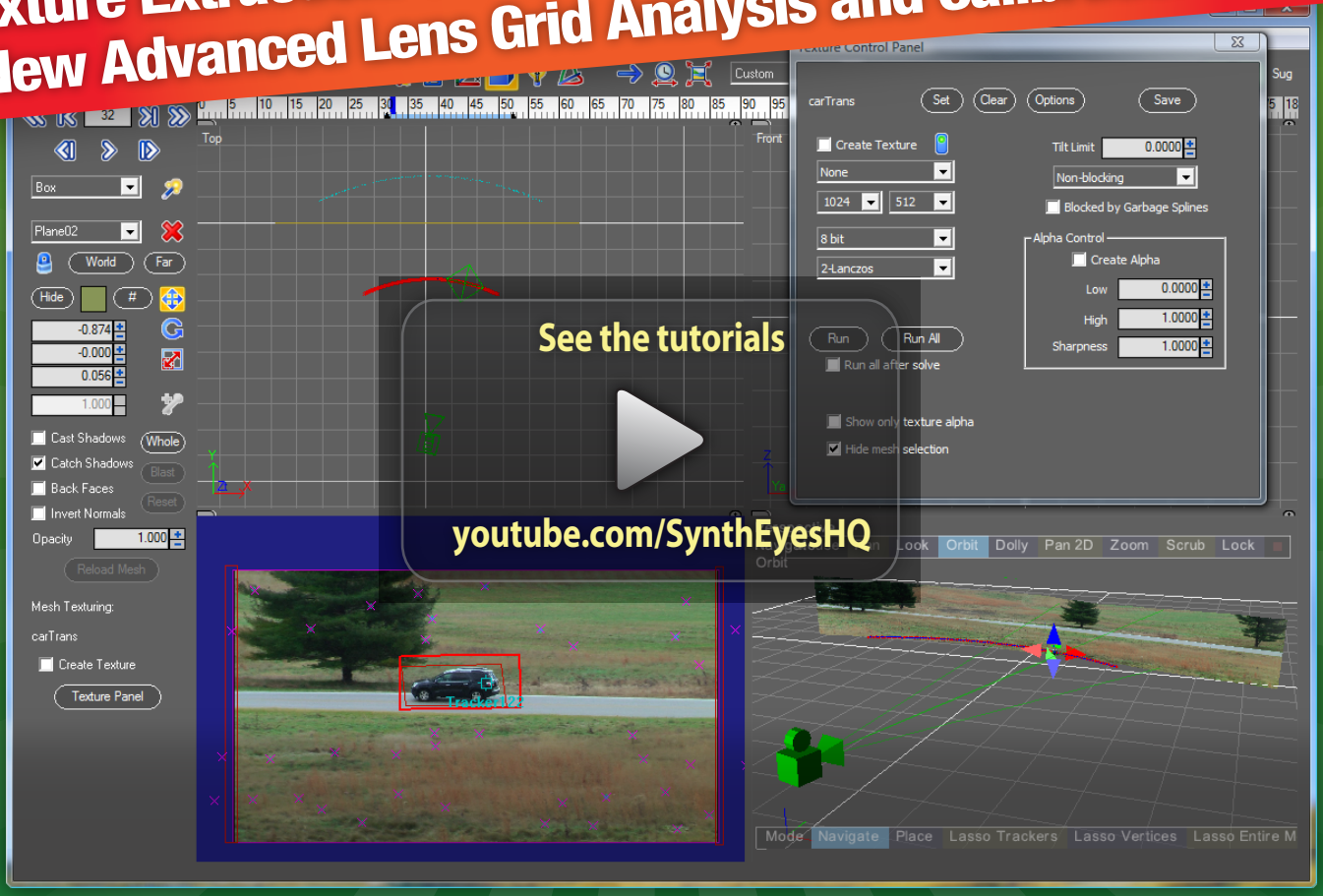
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THE LAST STAND

MAKING OF BY FRANCESC CAMÓS

In this issue Francesc talks us through how he created his thought-provoking image, *The Last Stand*. From sculpting in ZBrush to post-production, he covers it all in this Making Of.



"I ACHIEVED THE DRAMATIC LOOK I WAS AFTER WITH SEVERAL COLOR CORRECTIONS AND FINAL LEVELS AND CURVES ADJUSTMENTS."

THE LAST STAND

Software used: Softimage and ZBrush 4R3



01

My name is Francesc Camós and I am a texture artist at Kandor Graphics. I used to do personal projects at home for fun, but also to improve my skills with programs I rarely use at work. A big motivation for doing *The Last Stand* was to polish up my ZBrush skills, as well as to try MARI as the main texturing program for the first time.

I began this project by creating a proxy section of a railroad station in Softimage. This 3D draft allowed me to play with cameras, shapes and shadows while I was looking for a good composition.

At the same time I began sculpting an old woman in ZBrush 4R3. I started with a rough concept of her, which I developed in DynaMesh. The new brushes from the last updates of ZBrush were very helpful, such as the InsertMesh brush, which I used for making her hands and head, and the CurveSurface brush for her skirt and the rifle strap (**Fig.01**).

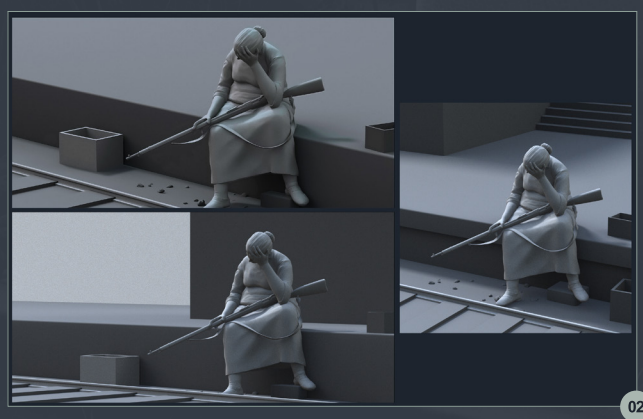
As the sculpted concept became more refined and bulked out, I exported different decimated versions of it to Softimage. I then continued to play with the camera angles until I got something I was comfortable with. As I was going for a still image, this procedure of going back and forth from the main composition in Softimage to the sculpting of the character in ZBrush saved me a lot of time (**Fig.02**).

Once that phase was completed I focused on the environment. For detailing the main assets of the environment, such as the pavement, planks of wood and stone and brick walls, I resorted to ZBrush again. I applied some brick, stone, and crack alphas to achieve big and fine details, and used the Standard and Move brushes to get rid of the unreal perfection of the base models (**Fig.03**).

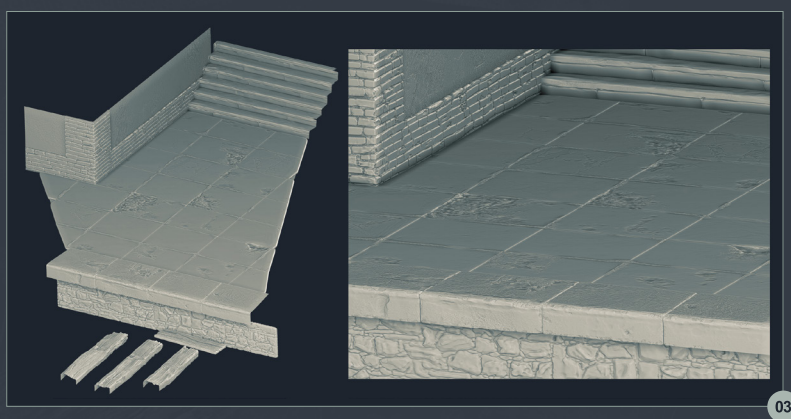
All UV unwrapping was done in UV Layout. Though ZBrush unwrapping tools have become very powerful in the latest versions, I still prefer the full control that UV Layout offers, even if the sculpting pipeline in ZBrush becomes a bit awkward.

Ptex texturing mechanics aside, I believe good unwrapping will not only save a lot of headaches in the texturing process, but establish the conditions necessary for good texturing.

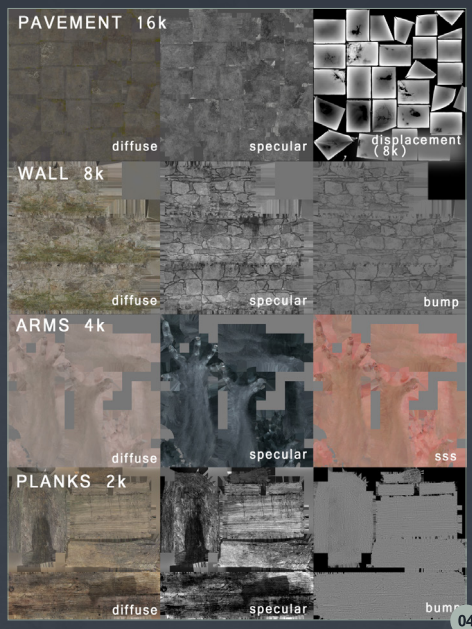
I used to create at least three texture maps for every object: diffuse, specular and bump, but in



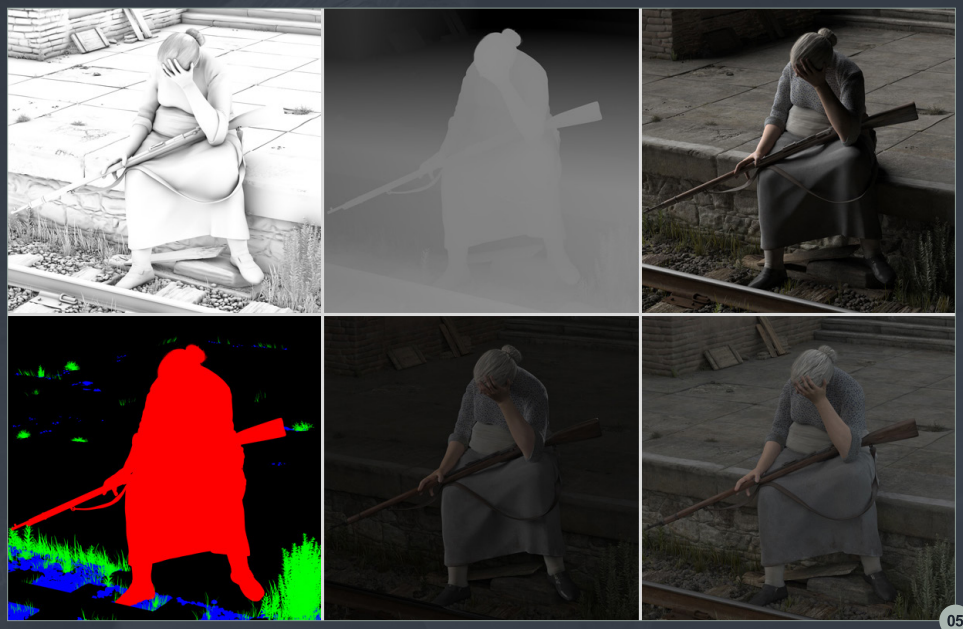
02



03



04


05

some cases shaders had to be extended with displace and/or sub surface scattering maps. All diffuse texture maps were done in MARI 1.4v1, while specular, bump and sub surface scattering maps were done in Photoshop CS5, and displacement maps were extracted from ZBrush (**Fig.04**).

In many cases, specular, SSS, and even some bump maps can be extracted through their diffuse parent map. I make as much use of masks as I can by texturing in a non-destructive way in Photoshop. That way I can reuse almost every layer in order to recreate specularity and sub surface scattering.

In MARI I try to follow the same philosophy; masked shader modules being my first choice. Although I render an occlusion pass in post-production, I also use baked occlusions to add some dirt on texture maps. In MARI I directly paint a dirt channel making use of the Masked Ambient Occlusion feature in the Projection palette.

The scene was lit with a main light, rim light, fill light and GI. I rendered six main passes, these were AO, DOF, MainLight, ID mask, Character light and Fill light (**Fig.05**).

The composition process I followed in post-production can be laid out in four steps:

My first step was to put together all light passes in order to get a nice balance between direct and fill illumination. I used the character light pass to accentuate the old woman, as well as a masked layer with the rifle ID to restore some specularity on the rifle, which had almost disappeared (**Fig.06**).

The second step was to apply an Ambient Occlusion pass and add some level adjustments that gave the image more contrast. Here I realized the skin tone was becoming very saturated, so I had to render a fast ID mask for her arms and face to decrease the saturation (**Fig.07**).

On the third step I noticed the image was not framed enough, and that shadows on the stage were getting too dim, particularly on the left corner and stairs. Too much attention was being drawn to the rail road section. Therefore


06


07


08



I painted some blurry shadows masked by several IDs. This partially helped me to achieve the dramatic look I was pursuing. I also recovered some small details on her arms that had been lost in the desaturation process and applied a soft color correction, masked by the DOF pass (**Fig.08**).

I achieved the dramatic look I was after with several color corrections and final Levels and Curves adjustments. Once I was satisfied with the composition I added a soft DOF using the Lens Blur filter, a small amount of noise and sharpened the overall result.

Thank you for reading this Making Of, and thank to the 3DTotal crew for letting me give back to the community part of the knowledge I have gathered through it.

FRANCESC CAMÓS
Email: fcamos@gmail.com

3DC next month

Here is what's in next months issue of 3dcreative

Tutorials

Beginners Guide to Modeling Futuristic Vehicles
Chapter 2
3ds Max & Maya

Olivia - Female Character Creation with Andy Hickinbottom
Chapter 1
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Image by Borislav Kechashki

Digital Art Masters
Volume 6



With the release of 3DTotal's book, *Digital Art Masters: Volume 6*, we have some exclusive chapters for you...

This is more than just an artwork book. Not only does it feature full-color, full-page images, but each artist has given a detailed description, in their own words, of the creation process behind each piece of published artwork. And they've done it especially for this book!

This month we feature:

"Irongore vs. The Invaders From Space"

by Dennis Allain



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The following shots of the “Irongore vs The Invaders from Space” book pages are featured here in full-resolution and can be read by zooming in...



Irongore vs. The Invaders From Space

By Dennis Allain

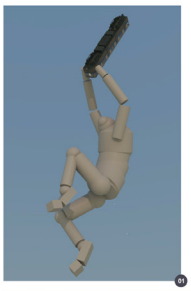
Job Title: Designer/Illustrator

Software Used: Cinema4D and Photoshop



The Challenge

In January 2010 the website CGTalk was sponsoring a design/illustration competition entitled, “CGSociety Challenge XXV - B-Movie”. This was to be a creative challenge to “bring life back into, or create a classic B-Movie”. There were three categories: still, video, or audio. Since I was, and still am, a big fan of science-fiction and horror, I decided to enter the competition because it would provide me with an opportunity to illustrate a subject matter that I do not typically choose. The fact that there was a real due date for the final entry also made the exercise worthwhile and forced me to be disciplined in my execution.



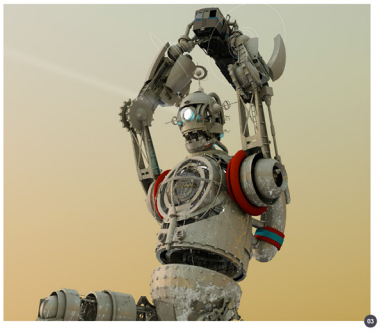


> “I built the hero robot from existing 3D pieces comprising a tank, train, artillery and miscellaneous machinery”

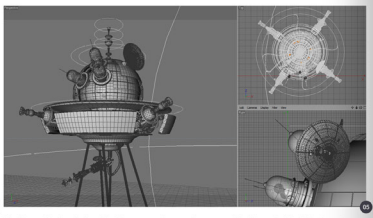
Beginning

The way I typically approach a design problem is to go straight to the 3D environment. I tried several programs back in the late 90s and eventually settled on Cinema4D. Currently I am using Cinema4D R11.5 Studio bundle. While working in 3D I can quickly test lighting, detail and camera views. For this particular image, I settled on an “Earth vs. alien” concept and chose an urban environment. I am not good at rendering people so I quickly gravitated to a more mechanical motif (**Fig.01 – 02**).

The first order of business was to start with our “hero”. I built the hero robot from existing 3D pieces comprising a tank, train, artillery and miscellaneous machinery. Often I will build



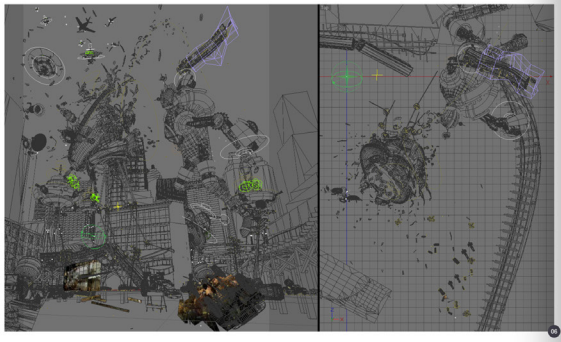




pieces that better portray the intended design as was the case for the hero’s eye and chest plate (**Fig.03**).

The villains (the flying saucers) seemed to be in-keeping with the B-Movie concept and I wanted them to have a futuristic aesthetic that would have been conceived by an illustrator living in the 1950s. There had to be two versions; a flying version to help populate the sky and a walking version at ground level. I will typically spend hours researching imagery on the internet for inspiration. For the saucers I looked for ray guns, alien craft, sci-fi imagery, etc. I saved these images in a reference folder and periodically referred to them for inspiration and guidance. To save time, I try to utilize pre-built 3D models as this helps free up time to spend on design, painting and experimentation (**Fig.04 – 05**).

I have wanted to create a city scene for some time now. I felt this could be a great setting for the epic battle that my characters would be engaged in. I imported the 3D characters from their own files into the center of the main scene file. Here I began dropping buildings around them to help start testing the final layout. I wanted a smaller building at the front and larger structures in the back. I also placed an elevated railway in the scene to help lead the viewer’s eye into the composition (**Fig.06**). This appeared to work well and provided an element in the story that could have a subtle interaction with our hero - the source of his weapon (the train car club!) (**Fig.07**).





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The following shots of the “Irongore vs The Invaders from Space” book pages are featured here in full-resolution and can be read by zooming in...



IT IS MY BELIEF THAT THE MARK OF A TRULY SUCCESSFUL IMAGE IS ONE THAT CAN TAKE THE AUDIENCE BEYOND WHAT IS ANTICIPATED

Final Stages

All of my work is created first in 3D and then finalized in 2D. I started using Photoshop back in 1995 in an attempt to help keep up with the demands of tight production schedules for the architectural projects I was involved with. My tastes throughout the years have always gravitated towards traditional artwork. My hope was to use computer tools that were readily available to me, in a manner that related more to the hand-drawn/painted world and less to the typical computer artwork being generated at the time.

When I “paint” in Photoshop, I bring the Cinema4D base render in and begin laying down washes of color for the sky and ground areas. Starting with bigger areas helps build my confidence while at the same time quickly provides a sense of progress (**Fig.08 – 10**).

I had decided early on to paint the explosion and smoke in Photoshop. This adds flexibility and a certain randomness that is more related to a hand-drawn aesthetic than it may otherwise be in a more precise medium. The challenge however, was to integrate the physical nature of the explosion (heat, color, highlights, etc..) onto the surrounding environment. I tried to accomplish this by selecting natural looking brushes to add color and highlights to elements closest to the blast (**Fig.11**). Months ago I downloaded brushes created by Yang Xueguo called “Blur’s Good Brush 4.0”. Although there are lots of brushes to choose from, they are great to experiment with and for creating natural textures.

Conclusion

Subject matter aside, my goal while developing an artistic expression for a design concept is to engage the audience and provide that audience with an image that is capable of telling a multitude of relevant stories. Designs and illustrations that my studio develops often have a singular subject, be that an architectural structure, environment or character. It is my belief that the mark of a truly successful image is one that can take the audience beyond what is anticipated and create a view into a world that succinctly portrays the design concept, while simultaneously enriching the viewers’ experience with a collage of additional sub stories or “moments”.



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